Vol. V

TRANSCRIPT OF RECORD

Supreme Court of the United States

OCTOBER TERM, 1930

No. 90

FRANK L. SMITH, CICERO J. LINDLY, HAL W. TROVILLION, ET AL., ETC., ET AL., APPELLANTS,

vs.

ILLINOIS BELL TELEPHONE COMPANY

APPEAL FROM THE DISTRICT COURT OF THE UNITED STATES FOR THE NORTHERN DISTRICT OF ILLINOIS

FILED APRIL 25, 1930

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VOL. V

INDEX

	Page
Testimony of Bernard Edward Sunny	1588
Testimony of U. F. Cleveland (recalled)	1605
Offers in evidence	1614
Testimony of William H. Crumb	1622
G. W. Cummings	1627
Cyrus G. Hill	1670
J. G. Wray	1710
Harry G. Wesphaln	1776
W. H. Crumb (recalled)	1777
K. E. Tholin	1790
Charles A. Heiss	1807
K. E. Tholin	1835
Stipulation re evidence	1859
Testimony of Frank Redmund (recalled)	1861
Stipulations re evidence	1862
Testimony of K. E. Tholin (recalled)	1865
Testimony of G. W. Cummings (recalled)	1866

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IN THE

District Court of the United States

FOR THE NORTHERN DISTRICT OF ILLINOIS,

EASTERN DIVISION.

ILLINOIS BELL TELEPHONE COMPANY,
Plaintiff,

vs.

P. H. MOYNIHAN, HAL W. TROVILLION, WILLIAM J. SMITH, ALEX J. JOHNSON, J. PAUL KUHN, JAMES R. CLARK and DAN JACKSON, the Persons Constituting the Illinois Commerce Commission of the State of Illinois, and OSCAR E. CARLSTROM, Attorney-General of the State of Illinois,
Defendants,

and CITY OF CHICAGO, a Municipal Corporation,
Intervenor.

In Equity No. 3746

ABSTRACT OF RECORD

Volume II

Defendants' Direct Testimony

Page of Record

EVIDENCE OF DEFENDANTS.

1120a to 1134a Exhibits of City of Chicago numbered 22 to 91, inclusive; also 27a, 31a, 31b, 31c, 31d, 65a and 73a were marked for identification.

1134a City Exhibit 46 offered and received in evidence.

1135a BERNARD EDWARD SUNNY having been first duly sworn as a witness on behalf of the City of Chicago, testified as follows:

Direct Examination by Mr. Haight.

My name is Bernard E. Sunny. Reside at 4913 Kimbark avenue, Chicago. I am chairman of the Board of the Illinois Bell Telephone Company and have been about 8½ years. Prior to that I was president of the company for some 12 years. My presidency began in 1908. Prior to that I was superintendent of operation of the Chicago Telephone Co. from 1879 to 1888.

1136a Between 1888 and 1908 I was with the General Electric in Chicago. For about three years, beginning in 1908, I was vice-president of the American Telephone & Telegraph Company. I have had no other connection with that company in an official capacity. I was president of the Wisconsin Telephone Company, Cleveland Telephone Co., Central Union Telephone Company and Michigan Telephone Company for some eight years, from 1910 or 1911 until 1919, I think. The four companies mentioned and the Chicago Telephone Company were known as the Central Group of Bell Telephone Companies. During the time that I was president of the Central Group, there were other officers who held the same office in each of those five companies. Alonzo Burt was first vice-president; H. F. Hill was vice-president in charge of operations; Mr. L. G. Richardson was general counsel; Mr. Garvey was the general auditor; Mr. Mizner was secretary and there were several other men holding minor offices who held the same office in each company. I think that was true during the entire period that I was president of the companies in the central group. There might have been one or two changes. Mr. Trafford was originally a vice-president but dropped out after a year or so and was succeeded by Mr. Hill, I think.

1138a The directors in each case were a separate body of men although I think that there were two or three representatives of the American Telephone & Telegraph Com-

pany on each board and they might have been identical men in each case. As to the other directors, they were not common as to several companies. I think Mr. Vail was on most of the boards and Mr. Bethel and Mr. Kingsbury and perhaps Mr. Thayer. During that period Mr. Vail was president; Mr. Thayer was a vice-president; Mr. Bethel was a vice-president and Mr. Kingsbury was a vice-president of the American Telephone & Telegraph Company.

1139a I remember a purchase made by Chicago Telephone Co. of certain long distance property of the American Telephone & Telegraph Co. here in Chicago January 1, 1911, and September 1, 1913. The circumstances leading up to that purchase were that the question of the right of the American Telephone & Telegraph Co. to operate at all within the city limits had been raised in the City Council and at my suggestion the A. T. & T. Co. sold out its property in Chicago to the Chicago Telephone Company and in doing so made a new contract with the Chicago Telephone Company by which a very satisfactory rate of return would accrue to the Chicago Telephone Company on the transaction.

1140a I am pretty sure that the purchase was made on the basis of the depreciated cost. The figures were gone into with scrupulous care on both sides and the transaction was put through after great care and at figures which were reasonable and fair to both companies. I knew in 1923

1141a a... know now that the American Telephone and Telegra... Company owned the New York Telephone Company, the N... England Company and a great many other compan... s which are now a part of the Bell System.

1143a Throughout my connection with the Chicago Telephone Company, the American Telephone and Telegraph Company continuously furnished engineering services of a very extensive character having to do with about all of the physical plant that was installed or owned by the Chicago Telephone Company. Referring to the character of the engineering service, they specified the size and type of poles, the size and type of wire, the cross arms, pins and

supplies. They specified switchboards, cables, conduits—about all of the physical property that goes to make up the telephone system. During the same period, and including
1923, the American Telephone and Telegraph Company
1144a had to do with practically all of the standardization of
the equipment. The practices of the American Tele-
1145a phone and Telegraph Company in respect to engineering was uniform so far as it came within my observation in all the companies of the Central Group.

I am broadly familiar with the so-called 4½ per cent contract. There have been changes made in it from time to time. To the best of my knowledge the changes made in connection with the Illinois Bell Telephone Company were also made as to the other companies of the Bell System. It is a uniform contract. The American Telephone and Telegraph Company has done accounting service for the Illinois Bell Telephone Company. Its practices with reference to accounting have been adopted in all of the Bell companies within my observation, so that the accounting system is uniform and is in accordance with the American Telephone and Telegraph Company's practices. Generally the work in-
1146a cludes all of the accounting of the Chicago Telephone Company and the associated companies except perhaps with reference to local matters, such as collections and forms used in connection with collections, although it may be now that those are also included in the list of the American Telephone and Telegraph Company's accounting. The Illinois Bell Telephone Company did not own any patents in 1923, or prior thereto. The ownership of the patents was in the American Telephone and Telegraph Company and/or in the Western Electric Company.

(Mr. Bangs: We have a patent license. The American Telephone and Telegraph Company holds about six thousand patents.)

1147a If it should happen that an employe of the Illinois Bell Telephone Company should make a patentable invention, the practice used to be that we called the attention of the Western Electric or the American Telephone and Tele-

graph Company to it, and if it had merit they bought the patent from the inventor and gave him a reasonable compensation for it. There was no experimental work or development work on such inventions by the Illinois Bell Telephone Company in recent years. In the earlier days we all of us took a hand at inventing and experimenting, but that is a long time ago, and what was done was not of very great importance. The general laboratory work for the Illinois Bell Telephone Company is done in the Western Electric shops in Chicago, and in the laboratory of the American Telephone and Telegraph Company in New York.

1148a The American Telephone and Telegraph Company performs work other than the accounting and engineering in connection with the Illinois Bell Telephone Company. It does a very important work with respect to directing the traffic, the best methods of handling the traffic, both local and long lines. It works out and adopts uniform practices for operators to follow in operating switchboards, and in the methods of routing traffic, both local and long lines. It makes continuous studies of the best practices to enable the speedy and accurate handling of the traffic of local and long lines.

I think the supervision of the specifications with respect to plant, the handling of traffic, the methods of accounting and the assistance that comes from time to time in connection with the financing and all other problems that arise constitute the bulk of the services of the American Telephone and Telegraph Company.

1149a The work of handling the purchase of additional telephone properties in connection with the Illinois Bell Telephone Company has been done mostly by the representatives of the Illinois Bell Telephone Company, sometimes with some help from the representatives of the American Telephone and Telegraph Company. The big extensions of our telephone service have primarily originated at home with the local company and in the routine which is involved in the planning of a universal system, those plans are gone over with the American Telephone and Telegraph Company. The plans of a universal system mean that the installation shall be uniform

as far as practicable in the respective territories constituting the Bell System, so that everything that is installed will work harmoniously and constitute a suitable addition to the complete system.

1150a The advice of the American Telephone and Telegraph Company in connection with determining the kind of new equipment that shall be bought by the Illinois Bell Telephone Company is very important and is in most cases governing—the local conditions being understood. In fact, we look to the American Telephone and Telegraph Company's engineering organization, which is equipped with very able and competent men to guide and supervise the work of that kind which is costing the Illinois Bell Telephone Company so much money.

It has been my experience that the services are the same in connection with matters of finding use for and
1151a disposition of old equipment. We buy practically all of the equipment for the Illinois Bell Telephone Company from the Western Electric Company on a purchase agreement with them. We are under contract with the Western Electric Company that we will buy from them. Most of the apparatus bought by the Illinois Bell was manufactured by the Western Electric Company only. The Western Electric Company is the manufacturing company for the American Telephone and Telegraph Company, which owns the patents.

1152a When the telephones of the country were taken over by the Government during the period of the war, there was no practical change in the operation of the telephone service of the Illinois Bell Telephone Company. Mr. U. N. Bethel was the representative between the Illinois Bell Telephone Company and the Federal Government. He was a vice-president of the American Telephone and Telegraph Company. Substantially all of the arrangements in respect to the various operating companies of the Bell System were handled through Mr. Bethel.

1153a When the telephones were turned back after the war, the settlement with the Government was made by either

Mr. Kingsbury or Mr. Bethel. So far as we know they were both connected with the relationship between the Federal Government and the telephone service.

The inter-change of facilities between the Western Union and Postal Telegraph Companies, on the one hand, and the telephone companies, on the other, is rather remote from the affairs of the Illinois Bell Telephone Company and anything I might say on that subject would be guess work.

I do not know who represents the local companies of the Bell System in matters before the United States Bureau of Standards.

The American Telephone and Telegraph Company has always done work for the Illinois Bell Telephone Company and other operating companies in the matter of making investigations on induction disturbances and matters of that
1154a character. It has always interested itself in any problem that had to do with the service of the Illinois Bell Telephone Company or any of the other associated companies.

I think the contract for the particular equipment for machine switching that was put in in Chicago in June, 1923, was made five or six years prior to that time and all during that period, from the time the contract was executed down to the time the exchange was put in service, was an almost continuous session of instruction by the American Telephone & Telegraph Company to employes as well as to subscribers.

Cross-Examination by Mr. Bangs.

The circumstances under which I again became connected with the Bell System after I had left it in 1888 were
1155a that Mr. French, representing Mr. Vail, with both of whom I had been associated in the nine years I had been with the Telephone Company previously, told me that Mr. Vail was very much disturbed about the local situation with reference to the Chicago Telephone Company; that they had recently been able to get a renewal of the franchise after a very bitter struggle spread over a number of years, and that the standing of the company with the press and the pub-

lic was unsatisfactory; that some of the local directors of the Chicago Company, Mr. Byron L. Smith and I think Mr. Sprague, had put the local situation up to the American Telephone and Telegraph Company and urged them to do something. They were very much dissatisfied with the situation and wanted something done. After several conferences I took the position of vice-president of the American Telephone and Telegraph Company, with headquarters in Chicago. About three or four months after that there was friction between the local company and the city and the president retired and I took the presidency of the company.

Mr. Vail represented to me that the Chicago Com-
1156a pany had been a very great burden on him and his associates and that he was pressed with very urgent duties from all over the country and wanted to be relieved of any worry or anxiety about the Chicago situation, and for that reason wanted me to take the position. For about two years after that I continued as vice-president of the Ameri-
1158a can Company. The letter from Mr. Bethel dated July 23, 1912 (City Exhibit 48), was merely a method of dis-
1159a posing of the salary of $36,000 a year, $6,000 of which was being paid by the American Telephone and Telegraph Company and $30,000 by the Central Group of the Bell Telephone Companies. The reason that a portion of the salary was paid by the American Company was that when I went to work for the American Telephone and Telegraph Company, as vice-president in 1908 it was at a salary of $25,000 a year, and when I became president of the Illinois Bell Telephone Company four or five months after that, I went on the Illinois Bell payroll, as I recall it, at $25,000, and $5,000 from the American Telephone and Telegraph Company, making a total of $30,000. I think that went along for some years and it may be that this $6,000 was an increase in compensation due to the fact that my responsibilities had been extended from the Illinois Bell Company to the responsible official for the Central Group of companies. I became a director of the Illinois Bell Telephone Co. in 1908.

1160a The other directors of the Illinois Company were as follows:

J. Russell Jones, for years president of the Chicago West Division Ry. Co., and at the time retired; John M. Clark, a prominent tanner and at one time I think was collector of the Port of Chicago; Robert T. Lincoln, son of President Lincoln and Secretary of State, president of the Pullman Co. and member of the law firm of Isham, Lincoln & Beale; Arthur T. Wheeler, a lawyer, member of the firm of Williams, Holt & Wheeler; Byron L. Smith, president of the Northern Trust Company; Arthur A. Sprague, of Sprague-Warner & Co.; Theodore N. Vail, president of the A. T. & T. Co.; D. Mark Cummings, capitalist, director in First National Bank and in other companies; Chauncey Keep, capitalist,
1161a director and vice-president of the Illinois Trust & Savings Bank; Theodore W. Robinson, vice-president of the Illinois Steel Company. Except for Mr. Vail and myself the other directors had no connection with the American Telephone & Telegraph Co. and were stockholders in the Illinois Bell Telephone Company. In 1909 the directors remained about the same. In 1910 Mr. William H. Miner appears on the Board. He is a manufacturer of railway supplies, draft gears for freight cars, etc. Mr. Miner was placed on the Board at the suggestion of Mr. Arthur Wheeler who was president of the Chicago Telephone Company for five years. He was my predecessor. He was not connected with the A.
1162a T. & T. Co. In 1912 Mr. John J. Mitchell's name appears as a director. He was president of the Illinois Trust & Savings Bank and went on the Board of Directors at my invitation. In 1912 Mr. Bethel's name appears, for the first time. I think he was then vice-president of the A. T. & T. Co. In 1914, Mr. Marvin Hughitt's name appears. He was at that time president of the C. & N. W. Railway Co. and went on the Board at my invitation and suggestion. In 1919 in addition to some of those already mentioned, there appear the following: Alonzo Burt, who was then vice-president; Angus M. Hibbard, who for 20 years was general manager of the Chicago Telephone Company and M. C. Kingsbury, a vice-
1163a president of the A. T. & T. Co.

In 1921 Mr. David R. Forgan appears on the Board.

He was at that time president of the City National Bank and had been receiver for the Central Union Telephone Company for some two or three years. At that time Mr. Edgar S. Bloom appears on the Board. He was a vice-president of the A. T. & T. Co. and had been a joint receiver of the Central Union Telephone Company.

1168 In 1925, Mr. W. S. Gifford appears as a director. He is now president of the A. T. & T. Co. At that time the directors were W. R. Abbott, president of the Illinois Bell Telephone Company; Edgar S. Bloom, vice-president of the A. T. & T. Co.; D. Mark Cummings, David R. Forgan, Marvin Hughitt, Chauncey Keep, William H. Miner, John J. Mitchell, Theodore W. Robinson and Bernard E. Sunny.

In 1926, after Mr. Hughitt's decease, Mr. Hale, operating vice-president, was added. In 1927, Mr. Robert P. Lamont was added to the Board. He is now Secretary of Commerce at Washington and recently resigned his position as director. He was put on the Board at the suggestion of Mr. Abbott. I do not recall at any time during this period from 1908 to 1928, inclusive, where any person other than one who

1169 was an officer of the A. T. & T., was placed on the Board of directors of the Illinois Bell at the request of the American Company.

(Mr. Bangs states that at no time did the American Co. have more than three members on the Board of Directors. In answer to the court's question, Mr. Bangs states that the A. T. & T. Co. owns almost 99 per cent of the stock of the Illinois Bell, but not this amount during all of the time. At one time they had a minority interest.)

1170 Of course, the most minute information was not given directly by the A. T. & T. Co. to all of the employees

1171 of the Illinois Bell, but in all matters that had to do with the operation of the service, with the furnishing of good service, with the creation and development of a universal system, a system that would not only give good service to the Illinois Bell but would give good service between the Illinois Bell and other parts of the country, all of those plans and specifications were issued by the A. T. & T. Co. We looked

to them for help and direction on all of those matters. It is a fact that after 1912, the American Co. could control every employee of the Bell Telephone Company if it saw fit to do so but it did not. So far as domination was concerned, it was an exceedingly easy boss. It had the power, but it came in the picture only to the
1172 extent of helping toward a first class telephone service.

In the management of the operations of the company after I became president, I had unusual freedom. I was scarcely ever interfered with except where I was inclined to err with reference to questions that had to do with the entire system, but in the management of the Illinois Bell and in the management of the companies in the Central Group, I had almost autocratic authority and scarcely ever was interfered with. I did not consult with the A. T. & T. Co. whenever I thought it was necessary to make an improvement in Chicago. Consultations with the American Company with reference to the development of the Chicago plant between 1908 and the time when the war broke out were rare,—limited. They had their own problems, routine problems in their
1173 territories, urgent problems in their territories and they were not eager to get into the Chicago situation any more largely than was necessary and so they left us to our own resources. We spent a great many millions in putting up buildings, renewing plant, conduit, cables, switchboards and things of that kind with little or no consultation with the A. T. & T. Co. An instance where they disapproved what I had done was the erection of what is now the principal telephone building at 212 West Washington street which was a 20 story building,—one of the first skyscrapers built in the Bell System. Mr. Vail was out to see us after the building was finished and occupied, and after looking it over he commented favorably on it; thought it was all right. I was curious about this comment and he said: "Why, didn't you know that we were very much opposed to this building down
1174 in New York? We thought you were making a mistake." I told him I did not know that. He said: "Well that is the case, but I think it is a very good job. I am going back to New York and build one like it in New York City."

Mr. Vail was a very strong, forceful, positive man with rare vision and rare courage. He had pictured what the Bell System ought to be in his mind from the very start—this is, that it would be one comprehensive complete system which would be good not only all over the United States but all over the world, and he worked to that end in a consistent and constructive way. He was more interested in the larger things that would lead up to a result of that kind than he was as to the details that went into the structure. He left his men very largely to their own resources. He was always glad to see us when we went to New York but was rather impatient if we brought any questions down there that ought to be settled at home. The questions affecting the policy of universal service or the Bell System as a whole he was most warmly wedded to, and he wanted to see that brought
1175 into effect, not only in the development of the Bell System but also in such manner as was practicable legally with the so-called independent companies. In such matters he was apt to issue very definite instructions. I sometimes obeyed them. I tried to but got into trouble several times.
1182 Mr. Vail's letter to me, dated March 24, 1909 (City's Exhibit 64), was in answer to a latter of mine of March
1183 22d. I think that Mr. Vail's remark that he regrets that I have brought the matter up again has to do with the suggestion of a connecting arrangement with some independent telephone companies which seemed to be practical in our territory, but in his wider view of the whole field he
1185 decided at that time it was impracticable. As to the deals mentioned in Mr. Vail's letter to me dated September 5, 1912 (Plaintiff's Exhibit 30), I am unable to explain why they were put through, but I rather assume the situation was that the negotiations may have been on between the A. T. & T. Company with the Federal Government with reference to competition in the telephone service, and that these two deals being put through at that time might have been embarrassing, although they probably were completed, because negotiations were begun long before those dates. I do not recall why I refused to follow Mr. Vail's instructions

as to those two deals. Of course, I don't assume that those two transactions were really in violation of Mr. Vail's instructions.

1186 Plaintiff's Exhibit 30 admitted in evidence.

1188 During the time that I was President, and so far as I know of my knowledge during the time that I have been Chairman of the Board of the Illinois Bell Telephone Company, the A. T. & T. Company has not reduced the functions of the Illinois Bell to mere routine following of 1189 instructions in the operation of the telephone business.

With regard to the relationship between the two companies, bearing on the executive, purchasing, engineering, operating and financing functions of the Illinois Bell, as I said before, we look to the A. T. & T. Co. for guidance and assistance on all engineering matters, for assistance and direction with reference to the handling of traffic so that our practices will be uniform with those of all of the companies with which we are connected, and cooperation with reference to financing and the serious problems of supplying the additional capital required for a very large development year by year and generally a very close relationship with 1190 the A. T. & T. Co. executives on all other matters to the extent where cooperation and discussion would be helpful not only to the Illinois Company but to the telephone system as a whole.

As President, I was never ordered by the A. T. & T. Company, or by any officer thereof, to do or not to do certain things except those of the type of incident outlined in the letter which I have just read (Plaintiff's Exhibit 30) with reference to toll connections and on minor matters of that sort.

During the time that I was President and while Chair- 1191 man of the Board, we had the right under paragraph A of the license contract, giving the licensee the right to use all apparatus, methods and systems covered by patents owned by the licensor. Also the right to use new and improved apparatus and the developments in the art of telephony resulting from the research and experimental work conducted by or under the direction of the licensor.

Paragraph B of the license contract providing for the continuous prosecution by the licensor of the fundamental work of research, investigaiton, and experimentation in the development of the art and science of telephony, in the development of plans, methods, systems and ideas designed to promote safety, economy and efficiency in the equipment, construction and operation of the telephone plants of the Bell System, was carried out.

Paragraph C of the license contract as to advice and
1192 assistance in general engineering was carried out; so was the provisions as to plant engineering, traffic engineering, operating, commercial, accounting, including the auditing of accounts, patents, legal and administrative.

Paragraph D as to advice and assistance in any financing required to be done by the licensee in the extension, development or improvement of its telephone system, aid in securing funds on fair terms as and when needed for new construction and other expenditures, but not at any time to a greater extent than the then condition of the finances and credit of the licensor may permit, has been carried out in continuous operation. At times we have required much financial assist-
ance from the American Company. In the beginning we
1193 required a great deal of assistance. We received it by advances of money, by subscription of the A. T. & T. Co. to stock in the Illinois Bell, as it was offered, and it was offered in large amounts some times when the money market was most unfavorable. It was always taken by the American Company at par. The specified forms of apparatus referred to in my direct examination meant standarized apparatus manufactured by the Western Electric Company. I cannot conceive of a satisfactory telephone system without standardization, and that would be true as to the telephone system in Chicago. Had it not been standardized, the service could not have been nearly as good as it is and it would be far from satisfactory.

1194 I do not recall the circumstances surrounding the writing of the letter from me to Mr. Bethel dated July 17, 1918 (City's Exhibit 65). It was more than eleven years

ago and I have forgotten the details. When the license contract between the A. T. T. Company and the Illinois Bell Company dated February 1, 1919 (Plaintiff's Exhibit 7) was executed, I was President of the Illinois Bell and the
1195 contract was presented to the Board of Directors, and approved by them. That is the contract that I have referred to in connection with the services rendered by the American Company to the Illinois Bell, since that time.

Substantially the same services were rendered by the American Company to the Illinois Bell prior to the execution of this formal contract. There may have been some modifications as the art developed.

I am familiar in a general way with the amount and method of payments that have been made by the Illinois Bell to the A. T. & T. Company under that contract. I consider the amount of compensation provided for under this contract to be fair and reasonable from the standpoint of the Illi-
1196 nois Bell during the entire period of the contract. I believe that the American Company has a minority interest in the Southern New England Telephone Company and about a 33⅓% interest in the Cincinnati & Suburban Telephone Company.

I know that the license contract substantially in the form in which it is in evidence here, is in effect with the Cincinnati Company. I have no personal knowledge with reference to the New England Company.

I don't recall, but I am under the impression, that during the period of Federal control the Postmaster General approved all of the contracts that were then in existence
1197 and authorized us to proceed without any change. The large extensions made in Chicago just prior to the war without any conversation with the American Company regarding the same, were made under plans and specifications of the A. T. & T. Company with respect to buildings and underground work, switchboards and exchange pole lines, etc.

As to the effect on the telephone business of this country of the form of organization of the A. T. & T. Co., its stock

ownership in subsidiary companies, its license contract with subsidiary companies and its ownership of the Western Electric Company, I have a very firm conviction that the original plan as blocked out mostly by Mr. Vail was a stroke of genius and has led to the building up of this one comprehensive, complete telephone system. The plan originated and was
1198 pursued for years under the most difficult circumstances, especially with reference to getting money fast enough to develop the business. In the first twenty-five years, there was a very great uncertainty in the minds of the public as to stability of service; the plant was fragile; legislation was difficult and the feeling of the public was rather antagonistic because it was a patent controlled device.

There were a great many elements to be met and overcome but latterly—about twenty-five years ago when the patents expired, the situation was made more difficult by the building up of so-called competing companies. They were not competing companies to the extent that they were new companies, that were created in territory where the Bell had not been able to raise the necessary money, to go in itself, so that the work of the Home companies, or independent companies, which began about twenty-five years ago was very—a very distinct benefit to the development of the art.

It took some time to get the relationship between the so-called independent telephone system and the Bell, so that they were reasonably harmonious, where the systems
1199 were connected together, but the original plan was kept in mind all the way through, and has not been changed today and probably will go on without any change for years in the future; but it is the only plan of universal service, first class telephone service, to everybody at the lowest possible rate, and it has been consistently followed from the beginning.

Re-direct Examination by Mr. Haight.

I don't know who drafted the agreement between the A. T. & T. Co. and the Chicago Telephone Company of February, 1919. I imagine the counsel for the A. T. & T. Co. with

the assistance of the executives of that company. I said that I had forgotten the circumstances as to the letter of
1200 July 17, 1918 (City Exhibit 65). I am sure the contract of February, 1919, was approved by the Board of Directors. The letter of July 17, 1918 (City Exhibit 65) was probably read to the directors as a matter of routine in connection with the contract. Referring to the minute book of Illinois Bell Telephone Co., Vol. 3, p. 53, which refers to the letter of July 17, 1918, I don't recall what else was done other than as shown by the record.

1202 There was an Executive Committee of the Chicago Telephone Co. in existence for many years constantly prior to June 30, 1923. There has always been an Ex-
1203 ecutive Committee. They act in the absence of a quorum of the Board of Directors. I don't know whether the Executive Committee approved the contract of February, 1919 between the A. T. & T. Co. and the Chicago Telephone Co. The record would be the best proof.

1204 The A. T. & T. Co. gave the same service to the Chicago Telephone Co. prior to July 17, 1918 and since February, 1919, has continuously given the same service up to the present time. Those services have been vastly more important in the past five years in Chicago because we have been developing and installing the machine-switching system which is one of the most involved and difficult pieces of electrical machinery that there is in the service.

1205 I don't remember the exact figures as to the percentage rate paid to the A. T. & T. Co. during the last five years but it was reduced from 4½, I think to 3½ and I think the present rate is down around 1½. I doubt if the three volumes of minute books, record any discussions at any of the directors' meetings. It is not customary in minute books of corporations to include any discussions but merely the substance of what has been agreed upon. In all of the years I have been an executive in the Illinois Bell Co., we have never had a divided vote on any question. If we could not agree among ourselves at that particular meeting we
1206 let the subject matter go over to some later time when

we could all agree. At all of the elections of directors by ballot, all eleven in each instance received each the same number of votes. I recall no variation in that history. The Executive Committee always consisted of five of the directors. There was a general representative of the A. T. & T. Co. and there was either three or four of the local men for convenience in getting meetings.

1207 Some time ago there was a provision put in the by-laws that whenever there was a lack of quorum of directors, that the directors present, whether regular members of the Executive Committee or not, could, on the appointment of the President, act as members of the Executive Committee at that particular meeting. The purpose of that was to be able to transact business without interruption. There were five members of the Executive Committee on July 31, 1918. Mr. Burt was vice president; Mr. Cummings held no office other than that of director; Mr. Hughitt was a
1208 director, but not an officer; the same as to Mr. Mitchell and Mr. Robinson.

1209 In 1923, I do not know how much stock was owned in the company by any of the directors except in my own case. There was some stock in my name to qualify me as a director. So far as I know, the A. T. & T. Co. was really the owner of that stock. I can't answer as to whether that is true as to other directors. I know some of them still own stock in their own names. It is true of Mr. Hughitt I think and true of Mr. Cummings. As to the Executive Committee (mentioned in connection with meeting of July, 1918), con-
1210 sisting of Mr. Burt, Mr. Cummings, Mr. Marvin Hughitt, Mr. John J. Mitchell and Mr. Theodore W. Robinson, only Mr. Burt and myself were active in the actual management of the Company. As to those present at a meeting November 27, 1918, Mr. Burt, Mr. Hughitt, Mr. Keep, Mr. Mitchell, Mr. Robinson and myself, only Mr. Burt and myself were active in the company. The same is true as to a meeting of October 27, 1920, at which the directors present were, Mr. Cummings, Mr. Angus Hibbard, Mr. Hughitt, Mr. Keep, Mr. Mitchell, Mr. Robinson and myself.

Re-cross Examination by Mr. Bangs.

1211 Mr. Hibbard was not active at that time. I think he had retired. By active in the operation of the company, I mean in the sense that they were officers of the company. The others were active as directors but not as operating officials.

1212 U. F. CLEVELAND, having been heretofore duly sworn, being called as a witness on the part of the defendants, testified as follows:

Direct Examination by Mr. Goldstein.

The Illinois Bell has a 30-day credit with the Western Electric Co., that is, bills are payable within thirty days after the statement is rendered.

1213 If they are not paid within the 30 days, there is no regular arrangement. Sometimes we pay, say, half of the bill ten days in advance of the date it is due and the other half ten days in arrear, but it is a give and take proposition.

As to the practice with reference to the issuing of stock to pay liabilities in the period from 1918 to 1925, the stock is sometimes issued before the plant is actually constructed and sometimes after. Generally in late years it has been issued after the construction has been completed. The stock was paid for sometimes in installments and actually issued with the completion of payment. During the period from

1214 1918 to 1925, other than by the sale and issue of bonds, the Illinois Bell Telephone Co. financed its permanent construction out of any money which was in the treasury, sometimes by funds which were not immediately needed and sometimes by borrowed money. Where the stock was issued in advance of construction, the proceeds of the sale of stock were also used in connection with such improvements.

I prepared City Exhibit No. 44. It shows three columns—(1) Chicago Gross A. T. & T. Co. tolls; (2) Illinois Bell Telephone Co. proportion; (3) American Telephone & Telegraph Company's proportion.

The Illinois Bell's proportion includes the 17c commission and also that part of the amount charged for the use of long lines plant which is applicable to these gross tolls. I
1215 have not segregated that in this Exhibit. I believe the details are in the record. City Exhibit 44 includes the toll revenues derived by the Illinois Bell Co., Chicago Division, through the operation of the long lines plant and the originating commission, and in addition, the Company is reimbursed for the entire expense of operating the long lines business.

I prepared City Exhibit 76. In that Exhibit, there is a statement marked 43 "Advances to Associated Telephone Companies, 1881 to 1925." Under that the item "12-9-1910 Central Union Telephone Company $300,495.78" was a loan made by the Illinois Bell Telephone Co. direct to the Central Union Telephone Company. The four items following that ($162,500; $1,287,500; $250,000; $300,000) concerning which there
1216 is a memorandum "Central Union Telephone Co. notes amounting to $2,000,000 purchased April, 1912, and sold back to the American Telephone & Telegraph Company" refers to a purchase during 1912 of Central Union notes totaling in gross $12,000,000 and $1,700,000 of that amount was repaid to us during the year 1912. Subsequent payments made during 1913 reduced the amount of those notes another $1,000,000. The $2,450,000 of that $12,000,000 of notes was exchanged for the rest of our outstanding notes in favor of the A. T. & T. Co. of a similar amount and finally $7,550,000 of the $12,000,000 was exchanged for notes of the A. T. & T. Co. which were paid off at various times during 1913 and 1914.

I think the record shows that these notes were purchased from the A. T. & T. Co. in 1912. These notes were originally issued by the Central Union Telephone Co. to the A. T. & T. Co. and endorsed by the A. T. & T. Co.

1217 I have not an exact list of those notes. There are quite a number involved. I think they started in 1905 and run during various periods. I think it probable that the list of notes aggregating $10,300,000 issued by the Central Union

to the A. T. & T. Co. and then endorsed over to the Chicago Telephone Co. shown in City Exhibit 77 are the notes referred to so that the notation "Central Union Telephone Co. notes amounting to $2,000,000 purchased April, 1912," in item 43 of City Exhibit 76, means notes purchased from the A. T. & T. Co. in 1912 and the notation "Central Union
1218 Telephone Co. notes amounting to $7,550,000 purchased by Chicago Telephone Co. April 8, 1912, and exchanged for A. T. & T. Co. notes Dec. 1, 1913," are the notes purchased from the A. T. & T. Co.

The notation: "Central Union Telephone Company's notes amounting to $2,450,000 purchased by the Chicago Telephone Company as follows: April, 1912, $2,450,000, and exchanged for like amount of Chicago Telephone Company notes in favor of American Telephone and Telegraph Company, November 24, 1913," refers to the notes purchased by the Chicago Telephone Company from the A. T. & T. Co. The notation: "Central Union Telephone Company's notes amounting to $1,000,000 purchased by the Chicago Telephone Company on October 1, 1913, in exchange for a like amount of Chicago Telephone Company notes in favor of the American Telephone and Telegraph Company," refers to the notes purchased by the Chicago Telephone Company from the A. T. & T. Co.

1219 Sheet No. 1, of item 43, in City's Exhibit 76, showing an item December 1, 1913, $7,550,000 as advances to A. T. & T. Co., refers to the notation in said item 43 of Central Union Telephone Company notes amounting to $7,550,000 purchased and exchanged for A. T. & T. Co. notes December 1, 1913. The notation that the $2,450,000 were exchanged for a like amount of Chicago Telephone Company notes in favor of the A. T. & T. Co. November 24, 1913, is shown on sheet No. 1 of item 42, City's Exhibit 76. That comprises the items of $200,000, 9-3-13; $300,000, 9-24-13; $1,500,000,
1220 10-1-13; and $450,000, 11-1-13, the notes of the Chicago Company which were canceled.

The interest on these notes purchased from the A. T. & T.

Co. was paid to the Chicago Telephone Company each month. The records show that we billed the Central Union Telephone Company and I suppose they paid the bills. They were paid in the name in which they were rendered. I don't believe that I am familiar with the circumstances under which these notes were resold to the A. T. & T. Co. The payments for
the $12,000,000 of notes as they were resold to the A. T.
1221 & T. Co. were made on various dates starting June 9,
1912, and ending December 1, 1914. The Chicago Telephone Company procured the funds to purchase the notes in 1912 from the A. T. & T. Co. by bond issue of $14,000,000 put out as of May 1, 1912. Undoubtedly part of that money was used in purchasing these notes.

The Chicago Telephone Company received $14,070,000 for
the sale of the $14,000,000 bond isue. They sold at a
1222 premium of $70,000. They were not sold to the A. T.
& T. Co. The maturity of the $14,000,000 bond issue was Dec. 1, 1923. There was a bond issue by the Illinois
Bell Telephone Co. in 1923 for the principal amount
1223 of $50,000,000. From the proceeds of the sale of the
$50,000,000 bond issue the $14,000,000 maturing bonds were paid. The $50,000,000 bond issue was sold at 92. The interest rate on the 1912 bond issue was 5%. The record shows that the $12,000,000 of notes were held in the treasury of the Chicago Telephone Company until they were resold to the A. T. & T.

Except in a very few cases where shares not subscribed for by existing stockholders were disposed of at a slight premium, the stock of the Chicago Telephone Co. and the Illinois Bell Telephone Co. was uniformly sold at $100 a share. Stock sold to the A. T. & T. Co. was sold at par excepting the
few shares I have mentioned, which were sold at a pre-
1224 mium. The total amount of the premium for those few
shares of stock sold at a premium was not of any particular amount. It was $3,433.25 at the end of 1925. Except for those few scattering shares, Illinois Bell Telephone Co.
received par for that stock. I do not know how many

1225 shares of stock were sold at a premium. The records do not indicate that any of the stock of the Chicago Telephone Co. was issued in consideration of the original license contract to it by the American Bell Telephone Co. I haven't a definite recollection whether we did or did not submit the 4½% contract of 1902, or any of its modifications to 1919, to the Public Utilities Commission of Illinois or the Illinois Commerce Commission prior to the case in which the order of Dec. 20, 1920, was entered. I cannot tell you whether the 4½% contract of Feb. 1, 1919, was ever submitted to the Illinois
1226 Commerce Commission prior to that case. I cannot at the minute remember in what way the toll contracts of 1891 or any of those methods of payment were submitted to the Commission, but they were undoubtedly in evidence in some way in these cases. I can't remember what position Mr. H. F. Hill held in the Chicago Telephone Co. on Apr. 15, 1910.

Referring to sheet 1 of City's Exhibit 76, "Advances to American Telephone and Telegraph Company," following "8-24-21, $3,053,000," there is the figure 8% less 2. It is 8% and not 6%. My recollection is that that rate was paid because the money loaned was some of that received as instalment payments on capital stock, which payments were subject to 8% interest on the instalments.

1227 *Cross-Examination by Mr. Bangs.*

The financial relationship in general between the American Company and the Illinois Bell so far as the lending of money is concerned is that whenever the Illinois Bell has funds for which it has no immediate use, the A. T. & T. Co. will take those funds and pay interest on them during the time which they have them, and will return them to us whenever we have need for them. When we are in need of funds we can get them at short notice from the A. T. & T. Co. The customary rate of interest customarily paid on funds advanced by the Illinois Bell to the A. T. & T. Co. is 6% minus 2%, if interest is paid monthly. At an annual rate that

amounts to 5.88. The purpose for the $14,000,000 bond
1228 issue in 1912 was to provide for construction needs.

The company got par and a small premium on a 5% bond. It did not need that money immediately. $13,000,000 all told was invested in these notes of the Central Union Telephone Company. The company received 5.88 net on these notes. It was paying 5% on its bonds. In 1912 there was $1,700,000 of the notes repaid; in 1913 $3,950,000; January, 1914, two payments of $500,000 each; March, 1914, two payments of $600,000 each; April, 1914, $150,000; June, 1914, two payments amounting to $3,250,000; July, 1914, $250,000;

September, 1914, $500,000; December, 1914, $1,000,000.
1229 The notes were paid at those particular times because we needed these funds for our own uses at those times. The records show that we get money from the A. T. & T. Co. any time we want it. I believe it is possible to get it. We have their assurance that we can get it whenever we need it. We have an assurance in connection with the preparation of the annual budget—that they will be prepared to advance to us the funds which are needed to carry out our construction program as evidenced by the annual provisional estimate. When stock is sold to the A. T. & T. Co., they always take it and pay for it at par.

The $50,000,000 bond issue of 1923 was partly to refund outstanding obligations, partly to reimburse the treas-
1230 ury for expenditures of moneys made that had not been secured by the issuance of securities, and partly to provide for future construction. One item that was refunded in connection with that bond issue was a note of $15,530,179.39 in favor of the Central Union Telephone Co. That was part of the price which the Chicago Telephone Co. paid to the Central Union Telephone Co. for its telephone properties in Illinois. That was the major part of the purchase price.

The Central Union notes in 1913 were endorsed by the A. T. & T. Co. before we purchased them. There were two small bond issues which had been assumed by the Chicago Telephone Co. in connection with the purchase of those Cen-

tral Union properties, amounting to $290,000, and the Chicago Telephone Co. bonds maturing Dec. 1, 1923, amounting to $19,004,000. After the refunding operations, there
1231 was $11,135,000 left in cash. A portion of it was advanced to the A. T. & T. Co. at 5.53% interest. That was the effective interest rate on the bonds. The American Company used a part of this advance from time to time to purchase bonds of the Chicago Telephone Co. as they were presented for payment in advance of maturity—I mean the bonds that matured in December, 1923. During the period from June to November, they purchased these various bonds and drew down from the trustee the treasury certificates which we had deposited with the trustee to safeguard the bonds, and the moneys paid and received back were treated as a part of this loan. It ran in this way up until the end of December, 1923, at which time the loan was repaid. The Illinois Bell Telephone Co. has not made
1232 any bank loans in substantial amounts since 1921. It is my opinion that without our relationship with the A. T. & T. Co. it would be difficult for the Illinois Bell to negotiate loans from banks. We haven't any liquid assets. Our cash balance in local banks is aimed at $1,000,000 at the present time.

In general, I am familiar with the license contract with the A. T. & T. Co. dated Feb. 1, 1919. Referring to paragraph 9 of that contract on page 11, and sub-paragraph D on page 12, which provides that the American Company shall furnish to the Illinois Bell "advice and assistance in any financing required to be done by the licensee in the extension, development or improvement of its telephone system within its said territory and in the general matter of its finances, aid in securing funds on fair terms as and when needed for new construction and other expenditures, but not at any time
1233 to a greater extent than the then condition of the finances and credit of licensor may permit, active assistance in the marketing of licensee's securities and such other necessary financial support and assistance in the premises

as will tend to serve the best interest of both companies," it is my opinion that the licensor, the A. T. & T. Co., has entirely discharged its obligations.

My opinion is based upon my knowledge of their services in connection with our various financing attempts, our bond issues, and they have at all times advanced the moneys that we needed in connection with our current operations and have always taken their full share of the offered capital stock, and have purchased those shares which were not taken by stockholders who were entitled to subscribe for them. I believe that if there was a catastrophe in Chicago today, which required our company to have $10,000,000 tomorrow morning from the American Company, that we could get it.

Referring to the second column of City's Exhibit 44, the Distribution of Gross Tolls, identified "I. B. T. Co.'s
1234 Proportion," there is included in the I. B. T. Co.'s proportion the entire amount paid by the American Company for the rental of the plant applicable to gross tolls. That includes the entire amount charged for the use of the plant applicable to gross tolls. There is nothing in those figures paid by the American Company for the cost of operating that plant.

Re-direct Examination by Mr. Goldstein.

I believe that City's Exhibit 76 contains the complete statement of all the financial transactions between the A. T. & T. Co. and the associated and subsidiary companies with the Chicago Telephone Company, or the Illinois Bell Telephone Company and the banks with which the Chicago Telephone Company and the Illinois Bell Telephone Company had transactions between the years 1881 to 1925.

1235 The 1923 bond issue was sold through a syndicate in New York represented by J. P. Morgan & Co. I don't think the A. T. & T. Co. itself participated in the syndicate. I believe that from 1911 to 1925 neither the Chicago Telephone Company nor the Illinois Bell Company at-
1236 tempted to sell any stock to the public. I assume that the rate of interest paid to the Chicago Telephone Com-

pany or to the Illinois Bell Telephone Company for moneys on deposit with the A. T. & T. Co. is established by the A. T. & T. Co., but it certainly is agreed to by the Illinois Bell Telephone Co. I have no knowledge whether that rate is the usual rate paid by the A. T. & T. Co. to the other subsidiaries of the Bell System.

As to the amount of permanent improvements undertaken by the Chicago Telephone Company during the years 1913-1914, which were paid for out of the proceeds of the $14,000,000 bond issue, the net increase in the company's Fixed Capital was approximately $14,170,000. There wasn't any
of the 1923 bond issue that matured in 1924 and 1925.
1237 There was some of it that was purchased through the
operation of the Sinking Fund. The terms of the mortgage provided that the trustee shall purchase bonds whenever he is able to get them for less than par. That is the only provision of the mortgage with reference to the retirement of the bonds. The Sinking Fund is a limited amount—$250,000 each half year. Except for the Sinking Fund provision, the bonds, by express terms, mature, I think, in 1956. I have not personally, on behalf of the Chicago Telephone Co. or the
Illinois Bell Telephone Co., ever made arrangements
1238 for any loans with the local banks. I have never discussed with any bankers in Chicago the matter of making loans for the Illinois Bell Telephone Co. or the Chicago Telephone Company. Where we have funds that we have no use for at the minute, we send down to the A. T. & T. Co. We reduce our bank balances to the amount that we need for immediate uses and the balance we send to New York.

Re-cross Examination by Mr. Bangs.

The A. T. & T. Co. assisted us in connection with our 1923 bond issue by handling the entire transaction with the purchasing syndicate. It is my impression the transactions were complicated. They made no charge for that outside of that covered by the license contract.

1239 *Re-direct Examination by Mr. Goldstein.*

I never made any attempt to negotiate any loans with any Chicago banks on behalf of the A. T. & T. Co. I do not know whether the Chicago Telephone Company or the Illinois Bell Telephone Company ever arranged for loans in Chicago for the A. T. & T. Co. I think there was no competitive bidding for the bond issue in 1923. I said I don't know.

(Mr. Bangs states there was competitive bidding.)

1244 City Exhibit 2 being a table of overhead expenses charged to construction 1911 to 1923 admitted in evidence.

City Exhibit 3, being entitled Summary Cost of Reproducing business of the Illinois Bell Telephone Company, Chicago Exchange, admitted.

City Exhibit 4, being Illinois Bell Telephone Company, Chicago Exchange, Plant and Equipment, admitted.

City Exhibit 5, being Illinois Bell Telephone Company Telephone Operating Revenues for the year 1923, admitted.

1245 City Exhibit 6, being Illinois Bell Telephone Company Chicago Exchange Telephone Operating Expenses for the year 1923, admitted.

City Exhibit 7, being Illinois Bell Telephone Company, Chicago Exchange, Income Statement for the year 1923, admitted.

(Note—City Exhibits for Identification 8, 9, 10, 11 and 12 heretofore admitted in evidence as Plaintiff's Exhibits 22, 27, 28, 29 and 23, respectively.)

City Exhibit 13, being Illinois Bell Telephone Company, Chicago Exchange, with several items for the years 1921, 1922, 1923, admitted.

City Exhibit 14, being Illinois Bell Telephone Com-
1246 pany advances to A. T. & T. Co. for certain years, admitted in evidence.

City Exhibit 15, being letter from Mr. Sunny, president Chicago Telephone Company to Mr. Kingsbury, Vice Presi-

dent A. T. & T. Co., dated Sept. 19, 1913, admitted in evidence.

City Exhibit 16, letter dated Mar. 10, 1911, from Mr. B. E. Sunny, President, to H. B. Thayer, vice president A. T. & T. Co., admitted.

City Exhibit 17, letter from H. B. Thayer, vice president A. T. & T. Co., to Chicago Telephone Company, dated February 14, 1911, admitted.

City Exhibit 18, Illinois Bell Telephone Company annual charge percentages applicable to long lines plant in Chicago admitted in evidence.

City Exhibit 19, Illinois Bell Telephone Company, present annual charge percentages applicable to long lines plant in Chicago effective January 1, 1920, admitted.

City Exhibit 20, Illinois Bell Telephone Company, Chi-
1248 cago Exchange, comparison of composite depreciation rates for the entire exchange area for each class of plant with a depreciation factor included in the annual charge, etc., admitted in evidence.

(City Exhibit 21 for identification heretofore received in evidence as Plaintiff's Exhibit 24.)

1249 City Exhibit 22, contract of Nov. 10, 1879, between Western Union Telegraph Co. and others with the National Bell Telephone Company, admitted.

1250 City Exhibit 23, original license agreement Dec. 23, 1881, between American Bell Telephone Company and Chicago Telephone Company, admitted.

City Exhibit 24, agreement July 1, 1891, between A. T. & T. Co. and Chicago Telephone Company, admitted.

City Exhibit 25—Letter January 7, 1896, from A. T. & T. Co. to Chicago Telephone Company subject Arbitrary Terminal Commission, admitted.

City Exhibit 26—Letter January 15, 1896, Chicago Telephone Company to A. T. & T. Co. subject Arbitrary Amount as Commission on long distance business, admitted in evidence.

City Exhibit 27, letter June 14, 1899, A. T. & T. Co. to Chicago Telephone Co., subject Simplifying Accounts,
1251 admitted.

City Exhibit 27-A, Calculation referred to in City Exhibit 27, admitted.

City Exhibit 28, letter June 21, 1899, A. T. & T. Co. to Chicago Telephone Company, Subject Simplifying Accounts, admitted.

City Exhibit 29, letter May 11, 1909, A. T. & T. Co. to Chicago Telephone Company, admitted.

City Exhibit 30, letter May 13, 1909, Chicago Telephone Company to A. T. & T. Co., admitted.

City Exhibit 31, two page letter, Feb. 14, 1911, A. T. & T. Co. to Chicago Telephone Company, admitted.

City Exhibit 31-A, Date and Book Cost of Toll Plant in Chicago purchased from A. T. & T. Co., admitted.

1252 City Exhibit 31-B, Resolution of Board of Directors, Illinois Bell Telephone Company, February 21, 1911, admitted.

City Exhibit 31-C, bearing on the outside cover "Case No. 11,894, Commission's Order of Dec. 22, 1921, Section 1, Exhibit D, Item 5, File 3-21-1922," admitted.

City Exhibit 31-D, bearing on the outside cover "Case No. 11,894, Commission Order of December 22, 1921, Section 1, Exhibit D, Item 6, Filed 3-11-1922," admitted.

1253 City Exhibit 32, letter March 10, 1911, from President, Chicago Telephone Company to A. T. & T. Co., admitted.

1254 City Exhibit 33, two page letter Dec. 5, 1917, from U. N. Bethel, Vice President, A. T. & T. Co., to B. E. Sunny, President, Chicago Telephone Company, Cleveland Telephone Company, Michigan State Telephone Company and Wisconsin Telephone Company, admitted.

City Exhibit 34, letter Dec. 10, 1917, from B. E. Sunny to U. N. Bethel, Senior Vice President, A. T. & T. Co., admitted.

City Exhibit 35, letter Dec. 14, 1917, from U. N. Bethel, Vice President, A. T. & T. Co. to B. E. Sunny, President, Chicago Telephone Company, admitted.

City Exhibit 36, letter Dec. 17, 1917, from B. E. Sunny to U. N. Bethel, Senior Vice President, A. T. & T. Co., admitted.

City Exhibit 37, telegram from P. W. Saxton to B. S. Garvey, Chicago, Jan. 14, 1919, admitted.

1255 City Exhibit 38, letter January 16, 1919, from General Auditor to P. W. Saxton, Acting Auditor A. T. & T. Co., admitted.

City Exhibit 39, letter Jan. 25, 1919, from P. W. Saxton, Auditor, to B. S. Garvey, general auditor, Central Group, admitted.

City Exhibit 40, letter May 28, 1920, from H. B. Thayer, President A. T. & T. Co., to B. E. Sunny, President, Chicago Telephone Company, Wisconsin Telephone Company, admitted.

City Exhibit 41, agreement May 3, 1921, modifying contracts of July 1, 1891, and Nov. 2, 1891, between Illinois Bell Telephone Company and long lines department of A. T. & T. Co. Admitted.

1256 City Exhibit 42, agreement dated August 23, 1923, entitled Schedule "A" between Illinois Bell Telephone Company and Long Lines Department A. T. & T. Co. modifying contract of July 1, 1891, admitted.

City Exhibit 43, Agreement between Illinois Bell Telephone Company and long lines department of A. T. & T. Co. dated August 22, 1924, modifying contract of July 1, 1891, admitted.

City Exhibit 44, Table of Illinois Bell Telephone Company's distribution of Chicago gross A. T. & T. Co. tolls between Illinois Bell Telephone Company and A. T. & T. Co. from 1913 to 1925, admitted.

City Exhibit 45, Copy of Resolution of Board of Directors, Illinois Bell Telephone Company, January 16, 1882, admitted.

1257 City Exhibit 46 showing Percentage of Stock of Illinois Bell Telephone Company and its predecessor Chicago Telephone Company from 1881 to 1925 owned by A. T. & T. Co. (previously admitted in evidence).

City Exhibit 47, Extract from Annual Report of A. T. & T. Co. 1911. Admitted subject to subsequent ruling on admissibility.

1258 City Exhibit 48, letter July 23, 1912, from U. N. Bethel to B. E. Sunny. Letter same date from U. N. Bethel to B. E. Sunny, together with statement of Mr. Bethel concerning same; three pages—admitted.

City Exhibit 49, Resolution of Board of Directors, Illinois Bell Telephone Company, April 26, 1911, relating to Central Group, two pages, admitted.

City Exhibit 50, contract January 1, 1894, between American Bell Company and A. T. & T. Co. admitted, subject
1259 to subsequent ruling as to admissibility (Part of record of *Read* vs. *Central Union Telephone Co., et al*).

City Exhibit 51, contract January 29, 1913, between Chicago Telephone Company and A. T. & T. Co. relating to employees' benefit plan, admitted.

City Exhibit 52, Pamphlet Illinois Bell Telephone Company, Plans for Employees' Compensation, Disability Benefits and Death Benefits, admitted.

City Exhibit 53, Contract Dec. 30, 1914, between A. T. & T. Co. and Chicago Telephone Company relating to plan
1260 to aid employees of Bell System to become Stockholders of A. T. & T. Co., admitted.

City Exhibit 54, Statement of Payments made by Illinois Bell Company to A. T. & T. Co. covering collections under employees' stock purchase plan for the years 1921 to 1925, inclusive, admitted.

City Exhibit 55, Contract Nov. 5, 1904, between West-
1261 ern Electric Company and Chicago Telephone Company, admitted.

City Exhibit 56, Standard Supply Contract and Supplementary Agreements between Western Electric Company and the Associated Bell Telephone Companies, admitted.

1262 City Exhibit 57, purchases by Illinois Bell Telephone Company from Western Electric Company each year from 1902 to 1925 inclusive, admitted.

City Exhibit 58, Resolution of July, 1911, Approving the Organization of Central Group, admitted.

City Exhibit 59, Showing Ownership of Stock in Western Electric Company by American Bell Company and A. T. & T. Co. from 1882 to 1913, inclusive, admitted.

City Exhibit 60, Contract on or about Feb. 6, 1882, between American Bell Telephone Company and Western Electric Company, admitted.

1263 City Exhibit 61, Modification, April 8, 1908, of Contract between A. T. & T. Co. and Western Electric Co., admitted.

City Exhibit 62, Articles of Incorporation, Chicago Telephone Company, now Illinois Bell Telephone Company with Amendments to July 19, 1923, admitted.

City Exhibit 63, Amendment to Articles of Incorporation, May 22, 1925, admitted.

City Exhibit 64, Letter March 24, 1909, from Theodore N. Vail, President, A. T. & T. Co. to B. E. Sunny, President, Chicago Telephone Company, admitted.

City Exhibit 65, Letter July 17, 1918, from Bethel, First Vice-President, A. T. & T. Co., to B. E. Sunny, President, Chicago Telephone Company, admitted.

City Exhibit 65A, Resolution of Executive Committee Illinois Bell Telephone Company of July 31, 1918, admitted.

City Exhibit 66, Letter December 16, 1912, from C. G. Du Bois, Comptroller, American Bell Telephone Company to B. E. Sunny, president, Chicago Telephone Company, admitted.

1265 City Exhibit 67, Letter January 29, 1913, from B. E. Sunny, President, Chicago Telephone Company to Charles G. DuBois, Comptroller, American Bell Telephone Company, admitted.

City Exhibit 68, showing payments made by Illinois Bell

Telephone Company to A. T. & T. Co. under license contract from 1902 to 1925, admitted.

City Exhibit 69, Average Number Telephone Sets based on Total Number of Receivers and Transmitters divided by two, 1912 to 1925, inclusive, admitted.

City Exhibit 70, average Number of Stations in Service, Illinois Bell Telephone Company, Chicago Exchange for the years 1919 to 1925 inclusive, admitted.

City Exhibit 71, Annual Payments by Chicago Telephone Company to American Bell Telephone Co. and A. T. & T. Co. for license revenues 1881 to 1901, admitted.

1266 City Exhibit 72, Resolution of Directors of Illinois Bell Telephone Company, February 21, 1922, admitted.

City Exhibit 73, Extract from Annual Report of President to Stockholders of A. T. & T. Co., Dec. 31, 1902, admitted subject to subsequent ruling on admissibility.

City Exhibit 73-A, Resolution of Board of Directors, Illinois Bell Telephone Company, Jan. 9, 1903, admitted.

City Exhibit 74, Answer filed by American Bell Telephone Company in suit of Western Union Telegraph Co., District Court of the United States, District of Massachusetts; objection by plaintiff. Objection overruled—admitted.

City Exhibit 75, Amendments to Defendant's Discharge in Western Union Telegraph Co., *et al. vs.* American Bell
1267 Telephone Co., District of Mass. Filed with the Master Nov. 20, 1907. Objected to by Plaintiff; objection overruled—admitted.

1269 City Exhibit 76 showing advances made by A. T. & T. Co. and associated and subsidiary companies to Chicago Telephone Company, Illinois Bell Telephone Company from 1881 to 1925; also advances by Chicago Telephone Company and Illinois Bell Telephone Company to A. T. & T. Co. and associated subsidiary companies, 1881 to 1925; also amounts borrowed by Chicago Telephone and Illinois Bell Telephone Company from banks from 1881 to 1925, admitted, subject to right of cross-examination.

The court states that it is the understanding that all exhibits in this case, that are not objected to are admitted in evidence.

City Exhibit 77, Stipulation relating to Central Union notes appearing in case of Read *vs.* Central Union Telephone Co., *et al.*—admitted.

1271 City Exhibit 78, Copy of Injunctional Order of Feb. 8, 1913, in Read *vs.* Central Union Telephone Co., *et. al.*, Superior Court of Cook County, Illinois—admitted, subject to subsequent ruling on admissibility.

1277 City Exhibit 79, Certified Copy of Final Decree in Read *vs.* Central Union Telephone Co.—admitted, subject to subsequent ruling on admissibility.

1280 City Exhibit 80, Balance Sheets Illinois Bell Telephone Co., years 1901 to 1925, inclusive. Admitted.

City Exhibit 81, Dividends Declared by Illinois Bell Telephone Co., 1881 to 1925, inclusive. Admitted.

City Exhibit 82, Statement of Net Earnings Available for interest and dividends, Illinois Bell Telephone Company, 1882 to 1925, inclusive. Admitted.

City Exhibit 83, Resolution of Board of Directors of Illinois Bell Telephone Co., Oct. 27, 1920, relating to purchase of Central Union Telephone Co. property. Admitted subject to subsequent ruling on admissibility.

1282 City Exhibit 84, Resolution of Stockholders of Chicago Telephone Co., Feb. 12, 1913. Admitted subject to subsequent ruling on admissibility.

1283 City Exhibit 85, Resolution of Board of Directors, Chicago Telephone Co., Jan. 26, 1916. Admitted.

1284 City Exhibit 86, Magazine Article from Telephone Quarterly, of Oct. 24, 1924, entitled, "A Publicly Owned Institution," from an address by Mr. W. S. Gifford, President of A. T. & T. Co., before the Bell System Educational Conference in New York Aug. 18, 1924. Admitted, subject to subsequent ruling on admissibility.

1285 City Exhibit 87, Magazine Article in Bell Telephone Quarterly of October, 1925, entitled "The Bell System,"

from an address by Mr. Bancroft Gherardi, Vice-President of A. T. & T. Co., at Bell System Educational Conference June 22, 1925. Admitted subject to subsequent ruling on admissibility.

1286 City Exhibit 88, Group of Advertisements of A. T. & T. Co. taken from certain magazines. Admitted subject to subsequent ruling on admissibility.

City Exhibit 89, Advertisements of A. T. & T. Co. in three publications. Admitted subject to subsequent ruling on admissibility.

City Exhibit 90, Extracts from Annual Reports of President A. T. & T. Co. to stockholders. (Offer withheld for subsequent disposition.)

1287 City Exhibit 91, showing loans made by A. T. & T. Co. to its subsidiary companies as compared with the license revenues received by it from various companies including the Chicago Telephone Co.

(Offer withheld for subsequent disposition.)

1288 City Exhibit 92, Order of Public Utilities Commission of Illinois in the Peoria Rate Case known as No. 3043,
1289 dated Apr. 17, 1918. Objected to by plaintiff. Objection overruled. Admitted.

1290 WILLIAM H. CRUMB, called as a witness on the part of the defendant, being first duly sworn, testified as follows:

Direct Examination by Mr. Haight.

My name is William H. Crumb. I reside at Glen Ellyn, Illinois. I am a consulting engineer and engaged in the general telephone engineering practice. Studied Electrical Engineering at Cornell University. In 1896 entered the service of the Central Union Company, licensee company of the A. T. & T. Co., and was employed by it in engineering and construction work for 4½ years. Thereafter for a year and a half I was employed by the Pittsburgh & Allegheny Telephone Co. of Pittsburgh, as general superintendent, and had

charge of the construction and operation of that company's telephone plants in Pittsburgh, Allegheny and surrounding towns. From 1901 to 1911 I was engaged in general telephone construction and engineering work in the City of Chi-
cago under the firm name of Wm. H. Crumb & Co. Dur-
1291 ing this time I built and owned or operated telephone
plants in Newark, Ohio; Sioux Falls and Yankton, S. D.; Belvidere, Ill.; Ishpeming, Negaunee and Marquette, Michigan; Laporte, Indiana; Hot Springs, Ark., and other cities. I was engaged in telephone engineering and valuation. July, 1919, I was engaged as a consulting and telephone engineer by the City of Chicago and testified before the Public Utilities Commission of Illinois in Case No. 9291, decided December 20, 1920. I testified before the Public Service Commission of Indiana in the proceeding involving rates of the Indiana Bell Telephone Company in Indianapolis and several other cities in Indiana. I testified in behalf of the Nebraska State R. R. Commission in a case similar to this in the U. S. District Court of Nebraska involving the rates of the Northwestern Bell Telephone Co. in Nebraska. I testified on behalf of the City of Detroit in the case before the Michigan Public Utilities Commission involving the application of the Michigan State Telephone Co. for increase of its rates in Detroit and other cities in Michigan. I was engaged by the City of Chicago in the preparation of evidence introduced by it and I testified in the case decided by the Illinois Commerce Commission August 16, 1923, in which the order was entered that
is complained of in this suit. As part of my work for
1292 the City of Chicago on both cases before the Illinois
Public Utilities Commission and the Illinois Commerce Commission I have had occasion to examine the books and records of the Chicago Telephone Co. and the Illinois Bell Telephone Co. The books and records to which I have had access consisted of the following: About the year 1912 or 1913, the accounting firm of Marwick, Mitchell, Peat & Co., under the employment of the City of Chicago, made a thorough investigation and accounting report of the accounts of the Chicago Telephone Co. from the date of its inception in

1881 down to and including, as I remember it, 1912. That report was in general form, for the years 1891 to about 1908, and in the four succeeding years, which I think were the years 1908 to 1912, the report was in quite extensive detail.

1293 Under the terms of the ordinance of the City under which the Chicago Telephone Co. and the Illinois Bell Telephone Co. have operated in the City of Chicago, it is provided that separate accounts shall be kept covering the business of the company in the City of Chicago, and reports of that business made to the Comptroller of the City of Chicago.

Operating under that provision, it has been the practice of the Chicago Telephone Company since the year 1912—1911 or 1912 to furnish quarterly reports of its financial and accounting transactions. Upon the adoption and the putting into operation of the uniform system of accounts as prescribed by the Interstate Commerce Commission, the company adopted the uniform practice of making certain monthly reports of its business in the City of Chicago, and other reports of its total business.

Copies of certain of those reports have been furnished to the city comptroller monthly, and those reports have been available to me and have been examined by me in great detail. Those reports consist of the following for the company as a whole: the monthly balance sheets, the monthly income statements, and for the City of Chicago, alone, the monthly revenue statement, the monthly expense statements, the monthly plant account statements, and monthly statements of the

1294 account of reserve for depreciation and amortization of intangible capital, the depreciation account statements.

For a period the depreciation account statement came, as I remember it, only quarterly, but during the past several years they have been furnished monthly, so that during the period from 1908 to date, or to the end of 1925, the comptroller has had very complete accounts of the financial transactions and the acts of the Chicago Telephone Company and the Illinois Bell Telephone Company.

I am familiar with the testimony given by Mr. Sloan in this case and the figures and conclusions given in advance by him on the item of Going Value. I have an opinion as to the propriety of the use of the figure given by Mr. Sloan for Going Value as a factor in determining the rate base for this company for the City of Chicago.

(Objected to by plaintiff on ground that it is a matter of law; objection overruled.)

1295 Mr. Sloan gave only one figure of going value. That was $21,500,000 or $21,750,000. It is my opinion that that or any other figure should not be included in a rate base of the Illinois Bell Telephone Co. in establishing its 1296 rates in the City of Chicago. I would not state that it is improper to include going value as one of the elements in determining the value of any business property for rate making purposes. I do not think it is necessary or 1297 proper as a part of the rate base for the Illinois Bell Telephone Co. in establishing its rate in the City of Chicago.

The reason I drew a distinction between this utility and other utilities is that in the first place I don't deny that the Illinois Bell Telephone Co. has what is ordinarily called a going value in the City of Chicago. I believe it has a very substantial going value but whatever has been the cost of establishing that going value which is in the possession and ownership of the Illinois Bell Telephone Co. has been paid for by the users of the service of the Illinois Bell Telephone Co. through the payment of their rates during the development of the business of the Illinois Bell Telephone Co. in the City of Chicago from the date of its inception down to the date where you choose to consider the going value. It is based upon the idea that in determining what is a reasonable return upon the value of the property devoted to public service, it is proper for the court to take into consideration the rates 1298 which have been charged in the past. That is my theory.

The Court: He is clearly giving an opinion on a matter of law.

Mr. Bangs: That is what I thought. May I have his testimony stricken?

The Court: I will let it stand. The record will show your motion.

I don't think of any other reason at this moment.

I am familiar with the so-called 4½ per cent contract. I have made two or more estimates of the cost to the A. T. & T. Co. of furnishing the services which it furnishes to the
1299 associated companies of the Bell System under the 4½ per cent contract.

(Objection by plaintiff on the ground that the question before the court is the value of the services to the Illinois Bell Telephone Co. and not the cost to the A. T. & T. Co.; objection overruled.)

The first estimate I made was in 1919 or 1920. The next one some time in 1922, and the second was more complete and was based upon the reports of the A. T. & T. Co. to the
1300 Interstate Commerce Commission for the years 1918, 1919, 1920.

(Objection by plaintiff on the further ground that services rendered during 1918, 1919 and 1920 are not material.)

I took the costs for furnishing services under the terms of the contract for the years 1918, 1919 and 1920 and averaged them, and the testimony based upon that average went into this case before the Illinois Commerce Commission. At the time that the testimony was given, I think on February 23, 1923, the reports of the A. T. & T. Co. for the year 1922 were not available. Later when the report for 1922 became available, I made another estimate of the cost.

1324 Witness withdrawn.

1328 G. W. CUMMINGS, called as a witness on behalf of defendants, having been first duly sworn, testified as follows:

Direct Examination by Mr. Goldstein.

My name is G. W. Cummings. I reside in Evanston, Illinois. I entered the employ of the Chicago Telephone Company in 1895 as acting manager and relief operator in Highland Park, Illinois. I then served in various capacities in construction, maintenance and operation from that time, in the suburban division until 1898. In 1898 I was employed by Kellogg Switchboard & Supply Co. as shopman and installer, building and installing central office equipment.

In 1899 I returned to the Chicago Telephone Company, Suburban Division, as manager; and was manager in various exchanges until 1901; from 1901 to 1903 I was employed by the Mutual Telephone Company with headquarters in Shelbyville, Indiana, where I had full charge of the construction and operation of that company.

1329 I returned to the Chicago Telephone Company in 1903 as test man in one of the Chicago offices and served as test man, switchboard man and wire chief in the Chicago offices until 1906.

For a short time in 1906 I was special inspector in the general offices and later in that year I organized the Plant Department School, which I conducted for eight years thereafter, my duties being to instruct the plant employes in respect to methods of constructing and maintaining the plant in the central offices and outside.

In 1914 I entered the employ of the City of Chicago as chief of the Telephone Bureau and served in that capacity for six years until 1920, my duties being to keep informed on all matters relating to rates and service furnished by the Chicago Telephone Company in the City of Chicago, and to advise the City Administration and the City Council in respect to those matters.

In 1920 I joined J. G. Wray & Company and have since

been employed continuously as telephone engineer on their staff, with present headquarters in the Bankers Building in Chicago.

In my work with J. G. Wray & Company I have made studies and investigations relating to the construction and
1330 operation, rates and services of telephone companies in various locations throughout the United States and Canada.

1331 A few of the more important cases that I have been engaged in, involved making studies of the orginal cost of the plant in Syracuse, Buffalo and New York City. In those cases I started with an appraisal made some years prior to the date of the inquiry and brought the appraisal down to date by means of the company's construction record. In doing that I necessarily obtained the cost of material and labor and the relation between material and labor and, incident to those studies, I developed cost indices reflecting those changes in cost levels. I did not use the indices directly in arriving at my answer as Mr. Sloan has done, but merely as a guide to judgment and testing the level of the book cost.

I have made inventory checks and made appraisals in many cases. Some of the most important were: New Jersey, Rhode Island,—where I presented to the Board of Public Utility Commissioners in New Jersey and in Rhode Island appraisals of the entire properties in each of those states.

1332 In New Jersey I also made a survey of rates in detail for southern New Jersey, the territory of the Delaware and Atlantic. I also made a comprehensive statewide survey of the service furnished throughout the State of New Jersey.

In Rhode Island and in New York I made a comprehensive studies of the operating expenses and also in the Provinces of Quebec and Ontario, in Canada; particularly with reference to the economics of machine switching, the effect of the machine switching program on the expenses of the company.

It is a part of my duties as telephone engineer on the staff of J. G. Wray and Company to keep informed on price levels,

maintain records for the guidance of our staff in appraisals and studies.

City Exhibit 93, affidavit of G. W. Cummings admitted in evidence.

1333 In preparing Exhibit A attached to City Exhibit 93, I examined the City Ordinances of 1907 to 1913, the rates established by the Postmaster General, the rates established by the Public Utilities Commission of Illinois and the rates established by the Illinois Commerce Commission of Illinois. In my examination, I did not find any provision in any of the documents in which these rates were established or indicated, that these rates include in any instance as part of the service for which the local exchange rate was established, the right or privilege in the local exchange subscriber to make use of the facilities of the Illinois Bell Telephone Company required to establish the connection between his exchange station and the toll switchboard in which the trunk lines of the long distance service terminate or between such exchange station and the toll trunks when such trunks are employed to effect connection with the toll switchboard without additional charge for such connection for the purpose of establish-

1334 ing a personal communication or transmitting messages between such subscribers station and some point outside of the City of Chicago over the long distance lines. By long distance lines, I mean the lines of the Illinois Bell Telephone Company used in connection with the A. T. & T. Co. for messages between points in the City of Chicago and points outside of the City of Chicago.

I examined Plaintiff's Exhibit 1 and heard the testimony of Mr. Sloan in connection with Plaintiff's Exhibit 1. I made an examination of the working papers of Mr. Sloan upon which he based Plaintiff's Exhibit 1.

1335 In Plaintiff's Exhibit No. 1, Mr. Sloan has developed certain figures which purport to represent for each account the percentage of increase in cost as of June 30, 1923, over each preceding period.

He then attempts to adjust the 1911 appraisal and the gross additions and retirements during each succeeding year to the

1923 cost level, by applying these percentages of increase to the appraisal and to the book costs of each period.

If these percentages do in fact measure the increase in cost levels the result is merely book cost adjusted to the 1923 cost level, or a book cost adjusted to compensate for the change in the purchasing power of the dollar in respect to those accounts during the period from 1911 to 1923, the period covered by his study.

That procedure does not and cannot give the cost of
1336 reproduction, which is an entirely different thing. Since Mr. Sloan has repeatedly stated this distinction I shall not go into it at this time.

Since, however, the claim may be made that it is indicative of the cost of reproduction I would like to discuss the method in some detail from an engineering standpoint.

If we wish to know what certain quantities of certain items which we bought in 1912 would have cost if we had purchased them in 1923 the obvious way to find out is to apply 1923 prices to them. That is not only the obvious way but is perfectly practicable since we actually made a study of that kind for all outside plant installed in New York City from 1914 to 1921.

Mr. Sloan did not do this, but instead applied per-
1337 centages which he says were based upon quantities and items representative of the 1923 plant.

He states that while the quantities and prices varied substantially from year to year he applied a test which showed a maximum error of 2 per cent in any one year and an over-all error of less than one-half of 1 per cent.

Since I have not been able to study the detailed records from which alone the facts can be determined, I cannot check his test; but am necessarily limited to an examination of his method.

Briefly, the defect in the method of his test, as I see it, is this: He says that he took the ten largest estimates in each of the three accounts—exchange pole lines, aerial cable and underground cable—priced out the actual quantities and

items in those estimates, and arrived at substantially
1338 the same result as by using the 1923 quantities and items.

Since, as he points out, most of the 600 pair cable, for example, is placed on the larger estimates and the larger part of the 25 pair on the smaller (routine) estimates, it would seem that by limiting his test to the ten largest estimates, he confined it mostly to the larger units, which involved a smaller dispersion of price changes and therefore indicated a smaller apparent percentage of error in his method than he would have found if he had studied all of the additions in each case, or a more representative grouping of them.

1340 Merely as an illustration of the effect of their weighting, I have reduced some of the percentages of increase in material prices which Mr. Sloan developed and used in Exhibit Number 86, in Commission Case 11894, which I believe was marked for identification here, and which I understand, he used in the valuation presented to the statutory court, to an index form on a 1911 base, and I have also reduced the corresponding percentages in Plaintiff's Exhibit I to the same form to admit of a direct comparison. I have prepared a table to illustrate the effect (Table marked as City Exhibit 94 for Identification).

1341 In his affidavit before the statutory court and in his testimony in the present case he has stated that in each case the weight he used was representative to a high degree of precision of the plant in service June 30, 1923. In this table, as I stated, I have set the two up in parallel columns for direct comparison; and combining his earlier figures with his present ones I find that the differences in weighting in the two cases produce differences in the resulting indexes ranging from 15 per cent minus—that is in the year 1917, in exchange underground cable (in the table it is 14.7 per cent)—to 14 per cent plus, which I find in the conduit account for 1914. That is, that the difference in weighting produces percentages of difference in the resulting index numbers to that extent, a total range of difference of 29 per cent, 15 plus 14. Now, if changes in the items purporting to be representative of the

same plant as of June 30, 1923, can produce so marked a difference in the result, the conclusion is to me irresistible that the admittedly wide differences in the items which were actually placed from year to year must produce a far greater difference in results.

1342 The 29% difference is between the earlier and the later calculations. That corresponds to what Mr. Sloan said would make a difference of less than ½ of 1%. He testified to a maximum difference in any one year of 2% and an overall difference of less than ½ of 1%. These are two appraisals of the same property. Mr. Sloan testified that the methods are substantially the same but the weighting was different, the fact that he used specific in one and routine in the other does not enter into this.

1343 I might state that this test is not comparable to the test which Mr. Sloan made because it is made on the same plant. Mr. Sloan's test was made to get the difference resulting from a weighting based on the entire plant and on the additions during each year, and that should show a greater difference than a comparison based on a study of the same plant such as I have made.

1344 I stated in my last comment that my test goes farther than contradicting Mr. Sloan's testimony. I would expect to find greater differences in comparing the weighting of the total plant with the weighting of the additions in any one year. This is shown by this check of mine which is based on total plant altogether—two different appraisals of the same plant.

His percentages of increase in labor cost being computed by pricing out a typical gang in each account at the wage level current during each year are subject to the same difficulty as the corresponding material percentages discussed above, in that they are based on a fixed weighting, while

1345 the actual unit placed—or, rather, the actual composition of the gang during each year—differed from that assumed in his computation, and the application of his test leads to results which appear even less conclusive because of

the wide differences in the composition of and cost of large and small gangs. In addition to that, percentages developed in that manner can only measure the changes in wage levels, not in labor cost. I believe Mr. Sloan recognized that fact.

Having developed percentages which purport to represent the percentages of increase in material and labor costs from 1911 to 1923, he then combined these two sets of percentages into a composite, purporting to represent the increased construction cost.

In order to do this, it was necessary to weight the material and labor percentages on a basis representing the respective proportions of each which went to make up the completed plant. I am wondering if it would be well to explain in this connection what is meant by weighting. I assume that everybody is familiar with it.

It is best explained by an illustration, of course. Sup
pose that we had a picnic party, and we wanted each
person there to have a piece of fruit, either an apple or
1346 an orange. The preferences, of course, would differ,
and we wanted each one to pay the average cost of that fruit. Suppose, for example, that we had forty people in that party, and we had fifteen oranges which cost seven cents apiece and twenty-five apples at five cents apiece. Now, the simple arithmetical average of five and seven, of course, is six, but if we collected six cents from each member of the party, we would not come out even. What we need is the weighted average, and we can weight it in either one of two different methods. First, we can multiply fifteen oranges by seven cents and find out they will cost $1.05. Then we can multiply 25 apples by 5 cents, and get $1.25, a total cost of $2.30, and a total number of pieces of fruit of 40. Dividing one by the other, we find that the weighted average of that fruit is 5¾ cents, and if we collect that from each member of the party we will come out even.

A slightly different method of weighting, which is more used where the figures are large, is to determine their percentages. In this case, we would say that fifteen oranges is

37½ per cent of the total number, and that 25 apples is 62½ per cent of the total. Then, if we take 37½ per cent of 7 cents,
we get 2.625 cents. If we take 62½ per cent of 5 cents,
1347 we get 3.125 cents. Adding those together we get the
same answer as before—5¾ cents. So that our weighting process is simply a process of apportioning different things according to the quantities or whatever the weight factor may be that will give a distribution corresponding to the importance of the various factors.

These proportions—I might say that in his appraisal Mr. Sloan used both of those methods—that is all detail. These proportions he determined for each account and each year by totaling the material and labor costs incurred on all, or substantially all, of the estimates under which the plant was placed.

A fundamental inconsistency in method will be noted here. Since his percentages of increase in material and labor costs are based on the material quantities and gang make-up as of June 30, 1923, not of the 1911 appraisal or of the gross additions and retirements each year, and consequently do not reflect the substantial differences which he testified actually existed throughout the years, as well as the differences in labor performance, while his proportions of material and labor are affected largely by such differences, both in the items placed and in the labor performance, it is obvious that —from a mathematical standpoint—multiplying one by the
other gives a result which has no practical meaning.
1348 This may be subjected to a very simple arithmetical
proof. I actually made computations from Mr. Sloan's figures on which I base my opinion. I refer to Table No. 1 in City Exhibit 95 for identification. The first table in this Exhibit deals with exchange pole lines and contrasts in the last two columns two widely divergent sets of index numbers both purporting to measure the same thing (changes in labor cost levels) and both resulting necessarily from his figures.
Since they conflict and since neither can be discarded
1349 without destroying an essential link in Mr. Sloan's com-
putation, his whole computation of index numbers, and,

in my judgment, his whole appraisal, falls to the ground.

The proof is this: Column 1 of the table, headed "Per Cent. of Increase of Material" (Sheet 1, City Exhibit 95) is copied directly from pp. 114-115 of Plaintiff's Exhibit 1. In setting up these figures Mr. Sloan says, in effect, that 1350 $100.00 worth of material bought in 1911 would have cost in 1923, 151.86 per cent more than the original $100.00, or a total of $251.86. Similarly, $100.00 worth of material bought in 1912 would have cost in 1923, $231.79, and so on down the column. While in a mathematical sense this is actually a series of index numbers, since it purports to compare on a percentage basis the composite price level of each year with the price level of the base, which he takes as June 30, 1923, it is not set up in the usual index form, and to simplify our discussion I have converted it to that form in column (2), using 1911 as a base.

Column 2 is headed "Material index" and is computed directly from column 1, which is Mr. Sloan's percentage of increase of material, or, rather, increase in material prices. In doing this I have not introduced any values or assumptions of my own, or changed in any way the relations between his annual price levels, but have merely, by a simple arithmetical computation, set up his ratios in a form which lends itself more readily to mathematical treatment. I have used 1911 as a base instead of June 30, 1923 as he did, because, as will be evident later, in order to use the latter date I would have had to assume that the proportions of material and labor which the company experienced during the six months ending June 30, 1923 were representative of conditions on that date or at the end of that period; and while I do 1351 not think that Mr. Sloan would quarrel with the reasonableness of that assumption, I did not wish to introduce any factor which was not already present in his figures.

I believe a slight difference in opinion developed during Mr. Sloan's cross-examination as to the propriety of the use of the term "index numbers" as applied to his figures, and I am wondering if it would be helpful to read Fisher's definition of the term.

Professor Irving Fisher, of Yale University, I believe is the leading authority on the subject of index numbers, and on page 3 of his book entitled "The making of index numbers" I find the following definition:

"An index number of prices, then, shows the *average percentage change* of the prices from one point of time to another. The percentage change in the price of a *single* commodity from one time to another is, of course, found by dividing its price at the second time by its price at the first time. The ratio between these two prices is called the *price relative* of that one particular commodity in relation to those two particular times. An *index number* of the prices of a *number* of commoditios is an *average* of their price relatives."

The whole science or art of index numbers lies in the
1352 weighting as between the different commodities and this whole book is devoted to that subject of weighting.

"This defination has, for concreteness, been expressed in terms of *prices*. But in like manner, an index number can be calculated for wages, for quantities of goods imported or exported, and in fact, for any subject matter involving divergent changes of a group of magnitudes."

Column 2 tells us, then, that according to Mr. Sloan's computations a certain material group which in 1911 cost $100.00, in 1912 cost $108.66, in 1913 $135.82, and so on down the column, the price on June 30, 1923 being $251.86.

The last figure, of course, being June 30, 1923, is the same figure that I referred to before as derived from the first column, which is made up of Mr. Sloan's figures. Everything else in column 2 is computed from the first column.

Columns 3 and 4 are also taken directly from pages 114 and 115. (Plaintiff's Exhibit 1.)

The form of the table is possibly a little misleading. There is a line drawn under the first line of the heading tying together columns 3 and 4, so that the full heading for both, which is common to both columns, would be "Each year's
1353 gross addition," and the sub-heading for the first column is "Per cent material" and for the second column "Per cent for labor."

These percentages purport to show the respective proportions of material and labor entering into all of the company's construction work in the exchange pole line account during each of these years.

Again stating it in terms of dollars—and these are the figures to which I referred before as being compiled by Mr. Sloan from the company's construction records, including all or practically all of their construction work during each of these years.

Again stating it in terms of dollars, it means that out of every $100 worth of pole lines placed in 1911 $47.40 was material and $52.60 was labor, in 1912 the proportions were the same as in 1911, while in 1913 the material was 58 per cent of the total, or $58 out of $100, while labor was $42, and so on. It will be noted that the respective proportions of material and labor fluctuated rather widely throughout the period, but with a gradually decreasing proportion of material and increasing proportion of labor, until in 1923 out of every $100 worth of plant placed $28.60 was material and $71.40 was labor. If in 1911 and 1912 the company required $52.60 worth of labor to place $47.40 worth of material, then labor
1354 was 111 per cent of the material. Column 5, which is headed "Per cent labor of material" is computed in that way, by dividing column 4 by column 3. It shows that, expressed as a percentage of material, labor amounted to 111 in 1911 and 1912, dropped to 72.4 in 1913, and fluctuated rather widely thereafter, closing the period at 249.6 in 1923.

In setting up the material price index in column 2 we have, following the lead of Mr. Sloan, assumed a certain group of material items which in 1911 cost $100 and found that in 1912 that same group would have cost $108.66; in 1913 $135.82; in 1914 $137.80; and so on. If, then, in 1911 the labor cost was 111 per cent of the material cost as shown in column 5, then it follows that in 1911 the labor cost of placing these items was 111 per cent of $100, or $111, as shown in column 6 entitled "Extension multiplied by 5." Similarly, in 1912 it cost 111 per cent of $108.66, or $120.61, as shown in column 6; in

1913, 72.4 per cent of $135.82, or $98.33, and so on down through column 6.

So, summing up, then, that portion of it, column 6, purports to show the labor cost of installing the material shown in column 2, that labor cost being determined by a direct computation from the company's actual experience as shown by their construction records.

1355 If, as shown by column 6, the labor cost of installing our hypothetical group of plant items was $111 in 1911, $120.61 in 1912, and rose somewhat irregularly to $588.46 during the six months ending June 30, 1923, it is a simple matter to find the ratio of the labor cost during each year to the 1911 level by dividing column 6 through by the 1911 figure, which is shown at the top of the column. This leads to the somewhat startling conclusion in column 7 that, according to Mr. Sloan's figures as worked out in the manner just described, in 1923 it would cost us $530.14, which is the bottom figure in column 7, to do the same job which in 1911 would cost $100.

That, of course, is simply another way of stating what we could find directly from column 6. That is in 1923—that is, in the six months ending June 30, 1923, it would have cost us $588.46 to do the same job that in 1911 would have cost us $111.

The heading common to columns 7 and 8 is "Labor index as computed from" and the sub-head for column 7 is "Sloan's material ratio" and the sub-head for column 8 is Sloan's labor ratio."

If we make the assumption I have already referred to,
1356 that the proportions of material and labor during the six months ending June 30, 1923, were representative of the conditions existing on that date, the labor cost of that same job on that date would be $566.34. That figure does not appear in the table because it would have involved making an assumption which stated I did not want to add to Mr. Sloan's figures. That is, as a matter of fact, nearly six and one-half times the cost shown, for example, in 1913.

That leads us to the conclusion that during the six months of 1923, ending June 30, 1923, the labor cost was 5.3 times

what it was in 1911, and as of the end of that period, the date of the appraisal, June 30, 1923, was 5.66 times. If we compare it, as I said, with 1913, the difference is still greater.

I do not believe that Mr. Sloan would claim that the labor cost of setting exchange poles was six times as great in 1923 as in 1911 or 1913; and yet his figures, if we assume them to be correct, prove that to be the fact.

As an interesting comparison, in column 8 I have re-
1357 duced to the usual index form with a 1911 base the per-
centages of increase in labor cost shown by Mr. Sloan on pages 114 and 115 of Plaintiff's Exhibit Number 1 and used in his appraisal. The contrast is startling. Both can not be right; and yet, as I have stated before, neither can be discarded without at the same time throwing out an essential step in his computation, and with it the entire result of his appraisal. The reasons for this discrepancy have already been referred to in the transcript, and I shall discuss some of those reasons further.

Mr. Sloan testified that the proportions of material and labor shown on pages 114 and 115 of Plaintiff's Exhibit Number 1 and copied from that exhibit to columns 3 and 4 of the first table in my exhibit were compiled from the com-
pany's construction records of both specific and routine
1358 estimates. While we have examined his summary sheets from which the figures in his exhibit were compiled, time has been wholly lacking to check the original records.

In other cases, however, we have made similar studies, notably in the New York Telephone case Nos. 7720 and 377. My working papers in the New York case cover a pile of 24
1359 column sheets—I would say 6 or 8 inches high. I have made similar studies developing index numbers and that sort of thing in the Inidana state-wide case and in the case of The Home Telephone & Telegraph Co., Ft. Wayne, Indiana. I have developed similar indexes from the records of the Northwestern Bell Telephone Co. and other smaller ones. Those are the large ones. In the Indiana case in the Federal Court we put in exhibits based on my studies of those index numbers, as I recall it.

From our familiarity with such records, we believe
1360 that the method described by Mr. Sloan and indicated by the summary sheets in his working papers should give the respective proportions of material and labor as actually experienced by the company with substantial accuracy. For the purpose of this discussion, therefore, I
1361 shall assume the accuracy of these figures.

Since, however, the combination of these figures with his material price index leads to the absurd result set up in column 7,—at least, it appears to be absurd—it is evident that if the material and labor percentages in columns 3 and 4 are correct, the material index in column 2 and consequently the percentage of increase in column 1—which is copied from Plaintiff's Exhibit Number 1 and was used in Mr. Sloan's appraisal—must be widely in error.

I am basing that statement, you will note, not on the comparison between columns 7 and 8, but on what appeared to me the absurd result obtained in column 7.

Aside from other possible factors, there are two fairly obvious reasons for this result. The first of these has been discussed rather fully in the cross-examination of Mr. Sloan, and consists of the fact that in developing his percentages of increase Mr. Sloan uses throughout the entire period a flat weighting designed to be representative of the entire pole line account as of June 30, 1923, in spite of the fact that the actual weighting throughout the period varied widely. Mr. Sloan recognized the danger of error in this procedure and attempted to check himself by the test I have referred
1362 to, arriving at the conclusion that the error was negligible. I have previously pointed out that by limiting his check to the largest estimates he would probably fail to measure the full extent of the error, and the absurd results of his figures shown in column 7 of my table demonstrate, in my opinion, that his error is very far from being negligible. The only way in which this error could in fact be measured would be to apply 1923 material prices to all of the items of plant in the 1911 appraisal and in the additions and retirements

during each subsequent year. While, of course, that involves more labor than to apply them to some of the items which, for reasons already stated, I do not think were representative, the labor of doing it is far from prohibitive, as evidenced by the fact that we did that for the much larger plant in New York City, pricing all the items both at the prices actually paid and at the prices of the base year. If Mr. Sloan had done that in this case he would, of course, have arrived at a correct answer directly, so far as material prices are concerned, without the necessity of resorting to adjustments by means of percentages of dubious validity.

The second obvious reason for the apparently absurd result shown in column 7 is that in multiplying column 1 by column 3, as Mr. Sloan has done, or in multiplying column 2 by
1363 column 5 as I have done, we have both committed the mathematical error of combining quantities which are incommensurable, in that columns 1 and 2 are based on a fixed weighting, constant through all the years, while columns 3 and 5 reflect the variable weighting which was encountered in the company's actual experience throughout this period. In other words, columns 1 and 2 on the one hand, and columns 3 and 5 on the other hand, are made up on entirely different and mutually inconsistent bases, and the result of combining them is necessarily meaningless.

In his cross-examination Mr. Sloan discussed our computation on page 19 of the printed copy of the city's affidavits, which I believe was marked for identification, and stated that it led to a meaningless result because, as he claimed, it was based upon the assumption that the proportions of material and labor were constant throughout the entire period. I quite agree with his statement that this, of course, was not the fact, and that if we had made any such assumption our answer would have been meaningless. The fact is, of course, as shown by the figures that I have just discussed, that our computation and our conclusions were based on exactly the opposite assumption that, as shown by the various figures in column 3 of that computation, which appears, as stated, on page
1364 19 of the printed copy of the city's affidavits—that col-

umn is headed in the computation "Per cent labor of material"—the proportions of material and labor varied substantially from year to year, and also on what appears to me to be the obvious fact—it is obvious if we compare the different columns—that the variations in that column are inconsistent with the variations in his material and labor indexes. That was discussed in some detail by Mr. Wray in his affidavit before the statutory court, and also in the affidavit in which this computation occurs.

In my present computation in City's Exhibit Number 95, which I have just described, I have followed precisely the same method as in the former computation in Mr. Wray's affidavit, the only differences being that I am now using Mr. Sloan's present figures as set forth in Plaintiff's Exhibit Number 1 now before this court instead of his former figures in his Exhibit 86 in Commission Case number 11894, which were the only figures available at that time; and that, for the reason I have given, I am now using 1911 as the base instead of 1919.

I have discussed the first table in City's Exhibit Number 95, which relates to exchange pole lines. Tables 2 to 5, inclusive, analyze in the same manner Mr. Sloan's figures in respect to the other exchange outside plant account.

1365 All of these are set up in the same form to represent the same kind of a computation, the same method being used throughout, columns 1, 3 and 4 in each case being copied directly from Plaintiff's Exhibit Number 1. Table 2 refers to exchange aerial cable, table 3 to exchange aerial wire, table 4 to exchange underground conduit and table 5 to exchange underground cable. These disclose discrepancies similar to those I have just discussed in respect to table Number 1 on pole lines.

There is a seeming exception in table number 4, however, which relates to exchange underground conduit, where the two sets of labor cost indexes are in practical agreement, which is the more striking in view of the wide disagreement between them resulting from Mr. Sloan's earlier figures in

Exhibit Number 86 in the Commission Case and brought out in my computation on page 19 of the printed copy of the city's affidavits in this case.

Mr. Sloan testified that in the present case he had changed his treatment of the proportions of the material and labor in this account because a large part of it is done by con-
1366 tractors. From a somewhat hasty examination of his working papers I understand that because of the contract feature he did not find in the company's construction records the same definite classification of material and labor costs on underground conduit that he did on the other accounts where the work is done by the company. And I might say that in my own experience I have found similar difficulty in other cases, notably the New York case. That, therefore, the proportions of material and labor shown for this account in Plaintiff's Exhibit Number 1 represent his best judgment rather than actual construction records. I know I found in the New York case that it was simply impossible to ascertain from the company's records what the relative portions of the material and labor entering into exchange underground conduit actually were.

That in forming his judgment he relied largely on his material and labor indexes, and it was, therefore, natural that in this instance his results should be consistent.

1367 Tables 6 to 9, inclusive, of City Exhibit 95 make a similar analysis of the toll outside plant accounts.

Table 6 relates to toll pole lines, table 7 to toll aerial cable, table 8 to toll aerial wire, and table 9 to toll underground cable. I did not make up a table for toll underground conduit, because, as I recall it, Mr. Sloan used the same per cent for that as for exchange. Figure 50856.00 in column 6, table number 6, is a startling figure. I reached that figure as follows: Column 1 headed "Per cent increase of material" is copied, as in the case of table number 1, directly from Plaintiff's Exhibit Number 1, pages 116 and 117. Column 2 is computed from column 1 by the same method which I described in connection with table 1—going back a moment to column 1, the

figures in column 1 purport to show that for every $100 worth of material purchased in this account in 1911, we would have
paid 137.42 per cent more in 1923, or a total of $237.42
1368 for what we could have bought for $100 in 1911. Similarly, for what we could have bought—and this is material prices only—in 1912 for $100 we would in 1923, or, rather, as of June 30, 1923, have paid 119.97 per cent more, or in dollars $219.97.

Now, I have simply reduced that figure to the customary index form in column 2, which represents precisely the same relative levels as between the different years as column 1. I set it up in that form simply because, as I stated, it lends itself more readily to mathematical treatment.

Columns 3 and 4 purport to represent the respective proportions of labor and material as actually experienced by the company in each of these years, and are copied from the same pages in Plaintiff's Exhibit 1. In 1913 the company's experience, as compiled by Mr. Sloan, shows that out of every $100 worth of toll pole lines built $97.70 consisted of labor
and only $2.30 of material. Now, as I have stated, I have
1370 not had opportunity to go into that. I believe the actual
figures appear on page 21 of Plaintiff's Exhibit No. 1 (showing $287.00 worth of work done that year). As to whether there must have been a great deal of work done on old material the only way to really find out would be to go back into the record. The difficulty that occurs to me in that connection is that rebuilding an existing line might be a maintenance charge rather than construction. This all purports to relate to construction. Just what it actually was, of course, I don't know, and would rather not try to guess. That figure of 2.3 is the reason for
that perfectly startling figure which appears in the other
1371 column. It is indicative of the relationship which to a
rational mind simply could not exist. The other differences in column 7 are not as startling as that but they show wide fluctuations. These tables 6 to 9 (City Exhibit 95) are less complete than the ones I have discussed relating to the exchange accounts, because the accounts are smaller and in

several instances show no material placed in some of the years. As we have just pointed out, material placed in that particular year in toll lines is very small. In table No. 7, there is no material placed in toll aerial cable in 1918. Here is a curious thing, apparently no labor used in 1919, although there was some material placed. That is on table 7 (City Exhibit 95), toll aerial cables. It might be interesting to
1372 look that up. It shows $1 gross additions. I have not attached any importance to the toll tables, in fact, I originally did not intend to put them in for reasons such as that.

Perhaps partly for this reason, the results are even more erratic than in the case of the exchange accounts, but with a single exception are less significant because of the smallness of the amounts involved. That exception is underground cable, which in Plaintiff's Exhibit 1, is listed at $1,371,615. As shown in table 9 (City Exhibit 95), I was unable to develop index numbers for this account on a 1911 base, because
1373 Mr. Sloan's figures in columns 3 and 4 indicate that the additions in that year consisted wholly of labor. Of course, the amount involved there is also small. I have therefore in this instance used a 1913 base, being the first year in which additions of material are shown in Plaintiff's Exhibit 1 for this account. The results of this index I think are equally startling with any of those that we discussed. The labor index developed in column 7 from Mr. Sloan's material index and ratios of material and labor ranges all the way from 65.79 in 1914 to 4642.46 in 1922, indicating that according to his figures, the labor cost of doing a given job in 1922 was more than seventy times as much as in 1914. This wholly impossible result is of course, the mathematical consequence of combining two sets of figures which are incommensurable, a material index based on a fixed weighting and a ratio of labor to material
1374 based on the varying weighting which evidently was actually experienced by the company. There is, of course, no consistency whatever between the two labor indexes in columns 7 and 8 both of which result directly from Mr.

Sloan's figures. I get these figures with respect to proportions of material and labor from the books of the company and their experience. I am assuming that Mr. Sloan works in this case from the same records that I have in other cases, the estimate ledgers where the material is posted as it is disbursed to the job. It appears when it was sent out and used on the job, in a similar manner as the labor is charged as it is done month by month.

1375 Those charges are made to the estimate ledger for each month, and represent for each month material disbursed to that job and the labor put on that job. There might be a case where, for example, a pole would be hauled out to a job on the last day of the month, and not set until the following day, but in practice, that sort of thing would be minimized as much as possible of course.

Conversely, it might be possible that we dug a hole on the last day of the month, and hauled the pole out and set it the next day, in which event the labor for digging that hole would be charged in one month and the pole in the next, and that again, would be minimized as much as possible in practice.

1376 I believe that Mr. Wray intends to testify more as to general principles involved on the subject. of arriving at an accurate conclusion without actually counting the
1377 poles and the wires and the value of them.

It is perfectly possible and perfectly simple to make an accurate index number of material prices. You have two factors involved there—price and quantity; there being no point to doing that in this case because the only correct
1378 way of making it that I know, is to price out all items, which would give the result directly without the use of index numbers. With respect to labor there are a multitude of variables which I shall go into somewhat in detail later on; but frankly I do not know of any method, and I have been playing with index numbers ever since they came into general use —and I think that they constitute one of the most valuable tools that we have, and one of the most dangerous.

I don't know of any way of building up labor indexes that will give a correct answer for the purpose for which Mr. Sloan has used his figures in this case. I mean one which will be mathematically sound—sound from a common sense standpoint. I am familiar with the formula to correct errers.

If combining Mr. Sloan's material index, which is
1379 based upon a fixed weighting, with his ratios of material and labor, which are based upon a variable weighting, is mathematically unsound, which I believe is amply demonstrated by the test I have applied in City Exhibit 95, for
1380 Identification, then he has also fallen into the same error with respect to his labor index, which is also based on a fixed weighting (the typical gang).

In addition to that, there are in this part of his computation at least two other sources of substantial error.

The first of these results from the fact that in a general way, the labor cost of installing plant units varies inversely with the size of the unit. Mr. Sloan illustrated this fact by saying that in putting up 25 pair cable the labor cost would be about 30 per cent of the total, while in the case of 600 pair it would be only about 12 per cent; and the same general difference would be found in all accounts.

Since his labor cost index is simply an index of wage scales, into the preparation of which this consideration did not enter, we have here another instance of the combination of incommensurable factors which involves the same mathematical error as I have discussed in respect to weighting.

1381 The other error is in respect to labor efficiency or output per man hour. The latter is perhaps the more correct term because it embodies not only the efficiency of individual workmen, but also of the handling of the workmen by the supervisory force, methods employed and all that sort of thing.

This is a factor in the varying proportions of material and labor during this period as shown in columns 3 and 4 of Exhibit 95, but as stated by Mr. Sloan on cross-examination, does not enter into his labor index.

In this respect also then, he has combined incommensurable factors.

In both the company's statement of evidence and Mr. Sloan's affidavit his appraisal was referred to as being on the basis of reproduction cost.

I thought I had a copy of the statement of evi-
1382 dence submitted by the Company as to what they intended to prove. By statement of evidence I mean the statement filed by counsel for the company with the court before trial. I quote from it.

1383 "William F. Sloan, of Madison, Wisconsin, Consulting Engineer, will testify that he made an appraisal of the Company's physical property (excluding land and building), as of December 31, 1921, and testified thereto before the Commission in case No. 11894, and that he also made an appraisal of the property of the company used and useful in rendering telephone service in the City of Chicago, by ascertaining the cost of reproduction new on the basis of prices for labor and material current as of June 30th, 1923, adding 12 per cent for omitted overheard or undisturbed construction costs, adding the book cost of general equipment and by accepting an appraisal of land made by Ward T. Huston of Chicago, and an appraisal of buildings made by E. A. Renwick of Chicago.

"That the reproduction cost new of the said property as of June 30th, 1923, exclusive of working capital, materials and supplies, work in progress and going value, but including the proper overhead allowances determined as aforesaid was at least $140,000,000."

1384 In his affidavit he said: "That he has made an appraisal of the property of the Illinois Bell Telephone Company, used and useful in rendering telephone service in the City of Chicago by:

"(a) Ascertaining the cost of reproduction new,
on the basis of prices for labor and material current
1385 as of June 30, 1923, of the Central Office equipment, subscribers' station equipment, and exchange and toll lines."

The rest of it relates to detail. The paragraph immediately following says:

> "That the reproduction cost new of the property as of June 30, 1923, used and useful in the rendering of telephone service in the City of Chicago, exclusive of working capital, materials and supplies, construction work in progress and going value, but including proper overhead allowances, is at least $145,248,344.00."

He uses the term "reproduction cost" throughout. He also uses the term "at least."

In his testimony, however, he has drawn a very proper distinction. For example he says: "I think that you confused what I have actually tried to do here with what you might call reproduction cost under present conditions."

1386 And he defines his result as "the book cost converted to the present day level."

On page 502 of the transcript, he discusses it in a similar manner. Obviously his method is not intended to give reproduction cost, but simply the converted book cost. It is for that reason that in discussing City's Exhibit 95 for identification, I have not stressed the conflict between Columns 7 and 8, which should be in agreement if Mr. Sloan's data and method did in fact give reproduction cost, but might differ to some extent if they result in something else.

Otherwise stated, if Mr. Sloan's material index and proportions of material and labor were correct, then Column 7 would be a true labor cost index which automatically allowed for all the variations in weighting, labor performence, and so forth, and the difference between it and column 8 would measure the extent to which Mr. Sloan's so-called labor cost index failed to allow for those variations.

Since, however, for the reasons already stated, I am forced to conclude that Mr. Sloan's figures which I used to com-

1387 pute column 7 are substantially in error and cannot give a correct result, the difference between columns 7 and 8 is evidently a composite of many factors; and can perhaps best be defined as being the result of all the errors alike in

Mr. Sloan's data and in his method, as well as representing the difference between reproduction cost and adjusted book cost.

In cross examination, on page 156 of the record, Mr. Sloan says:

> "You get what I am trying to tell you we get. We get the book cost converted to the present day level, absolutely."

On page 164 he says that

> "What I am trying to do is to find a reproduction cost of this property under the identical conditions under which it was built."

I wish to emphasize the term "identical conditions" as I take this to mean that what he is trying to do is to set up the book costs in terms of the 1923 dollar, and nothing else.

In a somewhat extended experience I have never before encountered the claim that such a figure was a measure of value, present day or otherwise. If I am trying today to sell a house built in 1913 the prospective purchaser is not 1388 interested in "the conditions under which it was built," which Mr. Sloan has so carefully embalmed in his figures, but only in what it is worth today, under present day conditions. If I built it under unfavorable conditions, and consequently at a high cost, that is my loss, and I cannot include any allowance for the excess in fixing present value.

Aside from the question of how far additions to a working plant are comparable to a reproduction project, that is probably the principal difference between an adjusted book cost and reproduction cost. Since, however, the Company appears to attach considerable importance to this adjusted book cost, I have examined Mr. Sloan's method with a view to ascertaining how far it does actually express the book cost in terms of the present day (or 1923) dollar.

Disregarding theoretical considerations of supply and demand, I think that we are ordinarily justified in assuming that current material prices are reasonably representative of what would be paid in a reproduction project.

Under that assumption, material prices would be the same whether we are considering reproduction cost or ad-
1389 justed book cost, and the criticism I have made of Mr. Sloan's material cost indexes would apply equally to both.

That is also true in respect to his procedure in multiplying a material cost index based on a fixed weighting by a ratio of material and labor based on a variable weighting.

In respect to his labor cost index and construction cost index there may be some difference in the effectiveness of his method according to whether it is designed to give reproduction cost or adjusted book cost.

The magnitude of the error in his labor cost index due to the use of a fixed weighting (the typical gang) throughout the period would not be affected by the use to which the index is to be put; and this is also true of the error resulting from the wide variation in labor costs as between large and small units and the actual wide variation in the size of the units placed from year to year, coupled with his assumption of a fixed weighting of the material units throughout the period. Whatever the magnitude of these errors may be, they are inherent in his figures, regardless of the purpose for which these figures may be used.

1390 A true labor cost index measure of the composite result of the changes in at least for variables: (1) wage levels; (2) gang makeup; (3) the differing proportions of material and labor involved in placing large and small units and the consequent effect on the labor cost level of changes in the average size of the units, and (4) efficiency, or output per man hour. Mr. Sloan's labor index purports to measure only the first of these, and would seem to take no account of the other three.

He claims that his test showed the effect of the second to be negligible, a conclusion which I have already discussed.

The third and fourth are reflected in his proportions of material and labor and in that way affect his construction cost index, although not his labor index.

The significance of this effect upon the construction cost index depends somewhat upon the purpose for which the index is to be used, and will, therefore, be discussed at this point.

Again using Mr. Sloan's illustration of the labor cost of placing 25 pair and 600 pair cable, let us assume that
1391 in 1912 the predominant size added was 25 pair, and in 1913, 600 pair.

If the labor cost of 25 pair cable is 30 per cent of the total, and of 600 pair is 12 per cent—page 144 of the transcript — then in 1912 the proportions of material and labor would be 70 per cent and 30 per cent, while in 1913 they would be 88 per cent and 12 per cent.

Let us further assume that the percentage of increase in 1923 over both of these years was 50 in respect to both material and labor. Combining these figures by Mr. Sloan's method to arrive at the increase in construction costs, we have:

1912

70%	of	50%	= 35%
30%	of	50%	= 15%
	Total		50%

1913

88%	of	50%	= 44%
12%	of	50%	= 6%
	Total		50%

Where the percentage of increase is the same for material and for labor, then the composite increase is the same in both years, even though the labor cost in 1912 was actually 2½ times as great as in 1913.

1392 Now, let us assume that the percentage of increase in 1923 over both of these years was 40 per cent for material and 60 per cent for labor. Combining as before, we have:

1912

70%	of	40%	= 28%
30%	of	60%	= 18%
		Total	46%

1913

88%	of	40%	= 35%
12%	of	60%	= 7%
		Total	42%

Where the percentage of increase is not the same for labor and material, then the composite is not the same for both years, and the extent of the difference in the composite depends on the extent of the difference between the percentages of increase.

Since the latter were developed on the basis of a flat weighting, which takes no account of the differences in the sizes of the cable actually placed each year, there is no logical connection between the two, and the result is not a mathematical conclusion but is, in the logical sense of the 1393 term, an accident which proves nothing.

This is, of course, simply a concrete illustration of the fallacy to which I have referred before, of combining two factors which are incommensurable. Since the factor of labor efficiency, or output per man hour, is involved in the same manner as the factor just discussed, an analysis of that would lead to a similar result.

From this analysis, then, I conclude that Mr. Sloan's construction cost index is affected to a substantial but wholly accidental extent by factor (3), the differing proportions of material and labor involved in placing large and small units and the consequent effect on the labor cost level of changes in the average size of the units; and by factor (4), labor efficiency or output per man hour. This is important, because to whatever extent his construction cost index is affected by these factors, it leads to an erroneous result when it is applied to the book costs.

If the book costs of the gross additions do in fact show the actual cost of the plant as it was placed, then to raise

them to the 1923 level in the sense in which I understand Mr. Sloan's testimony, which is to adjust simply for changes
in the value of the dollar and not for changes in labor
1394 efficiency or any other variable, then the adjusting fact-
ors used must include nothing but the change in the value of the dollar in each instance; in other words, material prices and wage levels. Since, as I have shown, his construction cost index is in fact affected by the other variables, its use for adjusting the book figures cannot lead to the result sought.

I do not know the extent of the error, but from the considerations I have discussed it would appear to be considerable, and in any event it is necessarily erratic by reason of the accidental nature of the effect on the index of the variables to which I have referred.

If Mr. Sloan's index is unsuited to the purpose of adjusting book costs to the 1923 dollars level because it includes—however accidentally—some allowance for the other variables, it is equally unsuited to the purpose of adjusting those same book costs to a reproduction cost level because that requires a definite and full allowance for all the variables, in that it assumes the construction of the plant under the conditions existing in 1923, including 1923 labor performance.

My conclusion, then, is that by reason of the numer-
1395 ous and substantial errors which I have pointed out as
inherent in Mr. Sloan's method, that method cannot give either reproduction cost or adjusted book cost with a sufficient degree of accuracy or certainty to be controlling in fixing a rate base.

City's Exhibits 94 and 95, respectively, admitted in evidence.

1398 *Cross-examination By Mr. Bangs.*

Pages 114 and 115 of Mr. Sloan's appraisal show the method by which Mr. Sloan developed the index num-
bers for the exchange pole lines. What he first pur-
1399 ported to do was to determine the percentage of in-

crease of material from 1911 to June 30, 1923. Then he determined the per cent increase of labor. Those two percentages were in the first column, 151% and 70%. Then he determined the per cent of materials that entered into the construction of the pole lines in the year 1911.

In respect to lines 3 and 4 I stated I accepted those figures for the purpose of the discussion.

Then he determined the per cent of labor. From the per cent of material and the per cent of increase of mate-
1400 rial he determined a composite per cent of material. He did the same thing for labor and he arrived at a total amount which he applied to the plant of 108%. He gave consideration to the percentage of material and labor costs in this year and in all subsequent years. He used in his computations in his final result at least these factors: the per cent of increase of labor and material in each year, the percentage of material and labor used in each year, based upon costs, and has from that derived the total percentage to be applied.

Referring to City Exhibit 95, in the year 1911, we find the percentage of material which Mr. Sloan used, stated in the first column, 151.86. We find the percentage of labor increase in the last column (8) in the bottom figure.
1401 That is the 170.06 compares with the 70.06 on page 114 (Plaintiff's Exhibit 1.) We find Mr. Sloan's percentage of material 47.4 in the third column and his percentage of labor in the fourth column 52.6. To derive the figure 100 in the second column of City Exhibit 95, the first column indicates that as of June 30, 1923, you would pay 2.5186 times what you paid for the same material in 1911, taking 1911 as a base, which is simply turning the thing
1402 around. I took 100 simply as a base. You can consider it as either dollars or per cent. I considered it both. I used both terms in discussing it. I thought for the purpose of discussion it was clearer to speak of it rather in terms of dollars. I took 100 as a base and made the 151.86 appear as 251.86 in 1923. If you add 100 to column 1 the

151.86 would become 251.86. Columns 3 and 4 are simply taken from Mr. Sloan's exhibit. I derived column 5 by dividing column 4 by column 3—that is, simply as stating the ratio or the per cent that the labor was of the material in each particular year. I derived column 6 by multiplying
column 2 by column 5. In other words, by multiplying
1403 the material index by the per cent that labor was of
the material in each year. It is immaterial whether we speak of dollars or per cent. I had $100 of materials in 1911. I found that the percentage of labor to material in 1911 was 111%, so I derived $111. The $111 represents what it would cost to install that $100 worth of material in 1911. Column 7 was derived by dividing column 6 by the first figure 111. 111 divided by 111 gives you 100 per cent, which is your starting point. The next figure in column 6, 120.6, divided by 111, gives you 108.66, the second figure. The $111 in column 6 is the amount of labor that it would have cost in 1911 to install the $100 worth of material. To get the first
figure in column 7, I divided the first figure in column 6
1404 by itself. 111 divided by 111. To get the second figure
in column 7 I divided the second figure in column 6 by the first figure in column 6. In other words, column 7 simply expresses the ratio that the labor set up in column 6 in each year was of the labor in 1911, or rather the percentage.

The figure in column 6 indicates what you would pay—as indicated by Mr. Sloan's figures—for labor to install the material shown in column 2, and is obtained by multiplying the material in column 2 by the per cent that the labor was of material in each year as shown by column 6. If it cost $111 for labor in 1911 to install $100 worth of material, then
it would have cost $1320.61 in 1912 to install $108.66
1405 worth of material. Wage level only was the method
that he used.

Obviously I did not derive column 7 by his method. I derived column 7 by combining his material index with his per cent that labor was of material in each year. Column 7 as computed in that manner gives us the relative labor cost

each year as compared with the actual labor cost in 1911. His level gives us the actual wage scale in each year as compared with the wage scale in 1911. His method does not show the
1406 percentage of increase in labor costs each year. It shows the per cent of increase in wage scale each year. That was not labor cost.

It is very different. Labor cost includes at least four factors—four variables—wage levels, gang make-up, changing for varying proportions of large and small units placed during each year, and labor performance—the output per man hour. He did not take those factors into consideration in computing his labor index.

Assuming his labor index as shown in column 8 includes a proper allowance for all four of these factors or variables, then I would say the difference between column 7 and
1407 column 8, assuming columns 3 and 4 to be correct, represented the error in his material index.

The figure 530.14 at the bottom of column 7 means that his labor costs, as I computed them, the way I have described, amount to 5.3 times as much per material unit in 1923 as in 1911. Assuming the correctness of his figures in columns 3 and 4, and assuming that his per cent of increase in material in column 1 is correct, then Mr. Sloan's method of appraisal mathematically set forth in this table shows an increase in labor cost of 500%. That percentage of increase in column 7 from 100 to 530 depends very much upon the fluctuations
1408 between the percentage of labor and material used in each year. That is not all that it demonstrates. In table 6 we have in the upper left-hand corner 137.42 taken from Mr. Sloan's appraisal. We have the 16% in column 3 taken from Sloan's appraisal. We have 84% in column 4 taken from Sloan's appraisal. We have 170.07 on the bottom of column 8 taken from Sloan's appraisal.

Table 4 is underground conduit. We have 138.55 in the first, 39.13, 60.87 and 321.50, at the bottom of column 8, all
1409 taken from Mr. Sloan's table. Here we have a very small variation between the percentage of labor and material.

The figure which I derived as Mr. Sloan's ratio on my method 289.09 is fairly comparable to Mr. Sloan's labor ratio, shown in his table. 289.09 is comparable with 289.12. On the basis of his figures there is very little variation.

1410 Toll line poles are referred to in Mr. Sloan's appraisal at pages 116, 117. (Plaintiff's Exhibit 1.) The first account is exchange underground cable; the second is toll pole lines. Take the year 1913 (City Exhibit 95), 77.37 is derived from Mr. Sloan's figure under 1913, per cent increase of material. To derive the material index for the year 1913, it is simply a computation from column 1. I take the 2.3 from Mr. Sloan's table under 1913 and also the 97.7. In table 6, column 8, we find with reference to the year 1913 the equivalent of Mr. Sloan's percentage of labor increase, 69.39. 69.39 is his percentage of increase and that drawn in index form with 1911 base gives us 100.41.

In other words, looking at page 116 of Plaintiff's Ex-
1411 hibit 1, you will notice that the percentage of increase shown in 1913 was just a fraction less than the percentage of increase shown in 1911. Therefore, the index would be just a fraction greater. The index 100.41 represents the per cent itself. He would apply that percentage for that year to the dollars for that year. Assuming only $100 worth of plant erected in that year, of which 2.3 represented material and 97.7 represented labor, he would apply 2.3% of material
1412 to the 77.37. What he actually did was to apply the 2.3% to the 77.37 and the 97.7% to the 69.39. If you would turn it around in index form you get the same thing if you apply his 2.3% to my 133.86 shown in column 2 of table 6 and apply the 97.7% to the 100.41. You would get the same result either way.

In column 7 there is an index ratio of 1083.07. It represents, upon Mr. Sloan's figures, the relative labor cost for that year over 1911. The formula by which the figures in column 6 are obtained is to multiply the material index by the per-
1413 cent of labor to material. I don't see that there is any relation between the figures of 2.3 and 97.7 used in

this computation and the corresponding figures of 57.5 and 42.5 in 1923. You get a percentage of 1000 in 1913 as compared with 1911 because that is what his figure worked out to. If instead of a relation 2.3 and 97.7 in 1913, I had a relation of 57.5 and 42.5, then the answer would have been entirely different, of course. The answer in that event would be substantially less. It would not be exactly Mr. Sloan's figure of 100.41. It would be 98½ in this way: 42.5 over 57.5 equals 74. In other words, on that basis labor was 74% of
the material. Now taking 74% of 133.86 gives you prac-
1414 tically 99. This is supposed to represent the cost of
labor for a particular year.

One of the elements in my computation here is that the cost of labor for the different years varies with the variation in the percent of labor to material. That is one of the factors. According to my computation variations in the labor cost are affected very much. If we find a particular year in which labor is as shown by the books of the company 99% of the cost and material is 1%, and for the preceding year we will say that the labor was 1% and the material 99%, then for the year in which, according to the books of the company it appeared that labor was 99 and material 1, the labor cost would
be 99 times as much as for the other year. And that is the
1415 result of this mathematical calculation. It seems to me
1416 obvious that if in one year labor is 50% of the total and
the next year it is 99%, that the labor cost in the second year has increased enormously ever the labor cost in the former year, whether or not wage scales increased. Labor cost is derived as a percentage of the material. If you place twice as much material at the same unit labor cost, you will have twice as many dollars for labor in that sense.

The cost of labor in the particular year affects the
1417 number of dollars that the company expends on a unit
of property put in.

Suppose the company puts in a pole line 5 miles long in the year 1911 at a total cost of $100,000 and assume that $50,000 is labor and $50,000 is material—making that computation as in City Exhibit 95, p. 1, the percentage of material and of

labor would each be 50 and the per cent labor of material would be 100. The ratio in table (7) would not necessarily be 100. It would be 100 taking the year 1911 as a basis. The base year would necessarily be 100.

Suppose in 1923 the labor cost remains the same, $50,000, but assume that the cost of the material has gone from
1418 $50,000 to $150,000 giving a total cost of the toll line of $200,000 in that event the figure in Column (3) would be 75 and the figure in column (4) would be 25. The figure in column (7) would be 100 because then your percent of labor of material would be 33, your index of material prices would be 300, 33% times 300 is 100. In the first column we have gone from $100,000 to $250,000 so the column is 250. The percent. of material is 75%. The percent of labor is 25%. The percent of labor of material is 33.

1419 In 1911 it was 50. In 1911 column (6) was 100. In 1911 the material and labor each cost $50,000 so that with a ratio of labor 100% of the material, your figure in column (6) would be 100. In 1923 you multiply 300 by 33%. The 300 is the material index in column (2) because your material has increased three times; it has gone from 50 to 150. So that
1420 your material index there is 300 and your percent labor of material has dropped to 33. In column (6) you get 100 which would accurately reflect your labor index on your assumption that the labor did, in fact, not change. If you transfer that to column (7) by the method I have used in building up column (7) your 1923 index there again would be 100 as it should on my theory. To assume that material cost changed from $50,000 to $150,000 and that labor remains constant at $50,000 and that the ratio of labor to material remains constant makes two mutually contradictory propositions. That could not happen. That is not what I have attempted to do in Table No. 1. This is set up to show what seems to me a
1421 necessary conclusion from Mr. Sloan's figures. Both columns 7 and 8 are necessary conclusions from his figures. (8) Is his figure directly, merely converted to a different mathematical form. (7) is a computation using my method but his figures and therefore following necessarily from them. My re-

sults in Column 7 are dependent upon the ratio between labor and material and on his material index. The results obtained in column (7) are a direct result of the variations in labor and material in columns (3) and (4), times his material index—both factors enter in. By "times his material index" I mean that I have multiplied the material index resulting from his figures by the per cent. of labor and material resulting from his figures so that both of those are essential factors in arriving at the result in column (7). If the material index remains constant then that would be a factor only be-
1422 tween columns (3) and (4). I don't know whether it would necessarily follow that the mathematical computation made in column (7) would become approximately Mr. Sloan's actual labor ratio if there is not any substantial variation from year to year in relation between labor and material. On Table 4, column (3) was practically derived from the material and labor indexes and therefore ought to give a consistent result differing in that respect from all the others. I think that there being no substantial variation in the relation between labor and material on page 4 accounts for that result. Table 8, shows a reversal in the ratio between (3) and (4), that is in 1911 for toll aerial wire 7.2% was the material cost and 92.8 was the labor cost, while in 1923, 70.3 was
1423 the material cost and 29.7 was the labor cost. Mr. Sloan's study of the actual records of the company for construction costs on the basis that he used, shows that labor cost went up from 100 in 1911 to 170 in 1923. On the basis of my mathematical computations, labor costs dropped very substantially, which it necessarily must do from the drop in the percent labor shown in column (4). I am somewhat familiar with the trend of prices for material and labor. I made the studies I am about to show in New York and in Indiana and I know the kind of work that goes into the construc-
tion of toll aerial wire. I have found nothing in my
1424 studies to indicate that the cost of toll aerial wire in 1923 was 97% less than it was in 1911. The percent of increase in labor costs and the cost of toll aerial wire from 1911 to 1923 increased substantially. If we should make a

graphic chart of Mr. Sloan's appraisal on a percentage basis of the material cost, we would start at 100 and go up to 200. Then on labor costs, we would have another group run from 100 say to 250 in 1923. Then to get the composite graph we would have a line running in between those two figures and that line would be determined by applying the actual percentage of labor and material in each year which would have to be mathematically determined.

1425 I could make a graph which would show the increase of costs of labor and material under Mr. Sloan's method from 1911 to 1923, provided that those proportions for labor and material were consistent with the indexes of the material and labor. I do not find from a hasty examination of the graphs in the New York case that I actually set up material and labor figures separately. I did not use those indexes directly in arriving at the results set forth in this study which was designed simply to bring out the original cost. I did, however, set up some indexes for the purpose of checking the reasonableness of the 1914 level which I started from, since the appraisal in that case was as of 1914.

The graphs used in the New York and Indiana and
1426 Syracuse cases show construction cost indexes and not separately for material and labor. I have a chart here entitled "Outside Plant, Manhattan and Bronx, Weighted Average Cost as of Dec. 31, 1914, 1914 level equals 100%." I did not state that I thought Mr. Sloan's factors of increase were correct because they approximated those that I had found in New York. My experience with the other studies certainly had nothing to do with the figures set up in City Exhibit 95. What I stated, as I recall it, was in reference to the proportions of labor and material from my experience.

1427 In other cases, particluarly this New York case, assuming that Mr. Sloan had followed the same method in this case that I did there, I was satisfied that that method should show the facts as they are set up on the company's construction records and therefore, for the purpose of this

discussion I accepted those proportions as correct. I mean the proportions of labor and material.

1428 (Objection on part of the City to going into inquiry to determine facts in some other case. The Court states the subject is to be controlled by discretion of court.)

I can give you now some of the material indexes I developed in New York. I have them in my notes.

1429 They were not introduced in the form of exhibits.

(Mr. Bangs produces documents marked "Comparison of Material Cost Levels, Typical Outside Plant Account" that have been identified previously as Exhibits A-331, 332, 333, 334 and 335, in the Indiana Statewide Commission case.) I know that I prepared similar tables.

1430 These tables were prepared by me in connection with the statewide case of the Indiana Bell Telephone Company or the case in the Federal Court.

(Documents marked for identification Plaintiff's Exhibits 31, 32, 33, 34 and 35.)

(Mr. Bangs produces document entitled "Comparison of Increase since 1914 in general commodity prices, selling prices of telephone apparatus to associated companies and telephone construction costs," evidently an exhibit number in the same case, A-291.)

1431 I know that we prepared graphs of that nature in the Indiana case. My recollection is that this particular exhibit was prepared by Mr. Halsted and not by me although I did prepare some along that line.

(Document marked as Plaintiff's Exhibit 36, for identification).

1432 I have here a price diagram used in the New York case for 1914 to 1921. It started with a lot of other index curves.

1433 I have here a number of graphs. Here is a comparison of a large number of wholesale price trends, index numbers from U. S. Department of Labor reduced to the 1914 basis. Here is one that I started to describe a few minutes ago,

comparing the copper index and labor index both from the U. S. Department of Labor with the actual cost construction index as I found it. That is a composite of labor and material 1914 to 1920. That is the solid line. The only purpose for which I used this and similar curves was in order to check the 1914 book cost.

1434 (Chart marked Plaintiff's Exhibit 37 for identification.)

In that chart I simply compared the construction cost levels as I found them from the company's records; a composite of labor and material cost in place, with the copper price and labor index published by the U. S. Department of Labor. That did not in any way enter in my curves of study but was done simply for the purpose of attempting to

1435 arrive at an estimate of the book cost level of 1914. This and similar charts is all that there are in the New York case. That chart (Plaintiff's Exhibit 37 for identification) was Manhattan and the Bronx. New York City comprises three divisions. Apparently I put that one in simply for the purpose of that comparison and as illustrating it. Assuming that Plaintiff's Exhibit 31 is my table and I know I did prepare tables of that nature, it was for the purpose of checking against an index which had been prepared of the cost levels in the State of Indiana. The reason that I said "an index" is there were three different index series compiled in that case. At least I compiled three.

1436 Which one this is I don't know. I took the New York data from the data which I had collected and which underlaid alike this diagram you have just seen and the cost study of the plant in New York City. I have here the cost study of the plant in New York City. That was made up first, as I recall it, from 1914 down to 1920 and then by means of additions brought to a point in 1921. To bring it from 1914 to 1920, I took the estimate ledgers. I took the appraisal as of 1914 as the starting point. From the estimate ledgers I compiled all of the items of plant, poles, cable, wires which were placed during each subsequent year to the end of the period covered by the study. I compiled those in items and I also

compiled the dollars of material costs and labor costs, arriving at the results shown there on that first page.

1437 I don't remember whether the difference between the book cost and the cost which I arrived at as of December 31, 1920 was set up. It is not shown on that table. So far as I recall, there were no charts that I compiled that were presented as exhibits in the New York case showing the increased cost of labor and materials other than that which has been marked here for identification. I testified on behalf of the defendants in the New York case. I did not testify in the Indiana case. I prepared exhibits and Mr. Wray testified on behalf of the plaintiff in the Indiana case.

I have brought material from the Syracuse and Buffalo cases. I think I did not testify in those cases. I did not
1438 prepare charts in those cases. What I did there was purely a cost study to find out what the plant had actually cost. I didn't develop any change in levels.

When I examined the exchange schedules of the company to ascertain whether or not there was any reference to use of the exchange plant in connection with toll calls, I did
1439 not find any reference in those schedules to the free use of exchange plants for fire and police calls or official calls. I examined the toll schedules. I testified only with respect to exchange schedules.

1440 My testimony is confined to local exchange schedules with no reference in local exchange schedules to toll usage. I have no reference to rates or exchange usage in toll schedules.

Referring to City Exhibit 94, I mean by weighting on index numbers, the effect of various weightings, that extent of the difference in index numbers which is produced by the change in weighting which is noted. My criticism of Mr. Sloan's appraisal with reference to that effect of weighting is that in his earlier appraisal he used a much smaller list of material in each account than he has in the present appraisal and he used a much larger list of material, somewhat different quantities, in various items now, from what he did then.

All this table purports to show is the effect of the change in the material list on his material index over the same period. I have carried it only to 1918 because the earlier figures
1441 went only to the middle of 1919. As I understand it, Mr. Sloan testified that he took 10 of the largest estimates in each account, where he could get them, and he priced out at the 1923 prices and he compared the results with the results which he got by pricing out his uniform list and quantity of materials and found in doing that, a maximum error of 2% in any one year or an overall error of less than one-half of 1%, and that comparison was made by Mr. Sloan in only his last appraisal so far as I know. My exhibit 94, is merely to illustrate the effect of his change in weighting on his index numbers. The effect on the per cent which he made in his
1442 last appraisal in which he testified there was only an error of one-half of 1% is merely this: That this comparison of his two appraisals of the same plant as of the same period in both cases using the weightings of quantities of plant which he testified were accurate to a high degree of precision. In respect to exchange poles, I think he said the figures he used before were representative of 95% of the poles and for aerial cable. I think he said 88% and so on. He has now changed to a different list of material items, and the effect of that change on the same appraisal is shown in this Exhibit 94. I would say it is not possible for Mr. Sloan to apply the methods that he used in testing his second appraisal to the first appraisal and find an error of only one-half of 1%. If the difference between the two, resulting from the change in weighting is as shown by Exhibit 94, then his test is bound to have shown a much greater error than ½ of 1% in one or the other—at least one or the other.

1443 Including routine estimates in the second appraisal and not in the first appraisal did not enter into this because this is a material index which is not concerned with that type of estimate. I still stand on the answer that I made on my direct examination that the 29% difference between the earlier and the later calculations corresponds to what Mr. Sloan said would make a difference of ½ of 1% because

what I meant by it was that the difference in weighting shown in this table is much less than the difference in weighting between the completed plant as of June 30, 1923, and the gross additions of any given year; so that by his test, I would expect to find a greater difference than I did by this test. That is what I meant by my statement there, a few minutes
1444 later. The test as shown in Exhibit 94 is not the same test that Mr. Sloan said would make a difference of less than ½ of 1%. I think it is a less severe test. Put it this way; let us assume that his test was 100%, that he had taken all of the material placed in each one of these years and had priced it at the 1923 prices. That would have been a complete and adequate test. Now my inference from Exhibit 94 is this. That if he had done that and gotten a complete and adequate test, he would have found a greater difference than I did by this relatively slight change in weighting here. It is not an identical test.

I don't pretend to be familiar with Mr. Irving Fisher's formula for testing the effect of variations of this character.
1445 I know the ideal formula. It is recognized by people who are experts in the use of index figures that there are methods of determining the effect of variances. For the purpose for which Prof. Fisher developed it, I would not say that this formula was applicable to the conditions here. There are formulas by which the effect of variables, the slight errors resulting therefrom, can be determined. Prof. Fisher's whole book is devoted to that. There is a reference to such a formula in Mr. Wray's affidavit. In my direct
1446 testimony I said I could not sell a house built under unfavorable conditions at a high cost on the basis of cost price, converted by applying the method showing the difference in the value of the dollar, to a prospective customer. If the house had been built under favorable conditions, of course, the converse is true. I am familiar with the index numbers which take as their base an average over a period of years and am familiar with the method used by engineers or by the courts prior to the decision in the McArdle case, of determining the reproduction cost or present value upon the use of the

average prices of labor and material over a period of years.

1447 In the Indiana case, a table was submitted worked out on various averages of that sort. It is the present custom to present the case on the basis of the present cost of reproduction. I never could see that averages over a period of years meant anything, while an instant value does, and I have always taken it that that was the reason why the longer period has gone out of use. One takes into account, of course, the trend of prices in the future.

1448 The peak as to cost is in the middle of the period of the five years previous to 1923. Whether taking an average of the five years would result in a lower reproduction cost than a reproduction cost estimate as of June 30, 1923, I don't know.

I have made so many index numbers of this sort and found them to vary so widely in different properties that I would hesitate to guess what they might show in this particular property. I would not expect a very substantial difference between the average of prices for the five-year period to June 30, 1923, and the prices as of June 30, 1923. They might be somewhat lower. That is simply a guess. It might or might not be true of this particular property. I assisted to a very limited extent in the presentation of the appraisal of the property of the Indiana Bell Telephone Company in the State of Indiana as of July 31, 1923, which was introduced in evidence in the proceedings in the District Court of the United

1449 States for the District of Indiana, before Judge Page.

I spent a short time in Indianapolis; only had a very small part in it. I don't believe I actually testified either before the Commission or before the Court. I did prepare certain charts here in Chicago and did a little field work on the appraisal. I don't say I specialized in the preparation of index numbers. I do a great deal of it.

(Document marked as Plaintiff's Exhibit 38 for Identification.)

To the best of my recollection, said exhibit was prepared by Mr. Halsted.

1450 This document entitled "Indiana Bell Telephone Company Index Numbers Telephone Construction Costs—All Accounts except Right of Way, Land and Buildings, Toll Plant in Indiana, J. G. WRAY & Company, Engineers, First National Bank, Chicago." I do not identify as my work. I don't recognize the writing. Some of these figures are mine.

1451 I think that the dollars shown there (Plaintiff's Exhibit 38) were worked out by Mr. Halsted, and the pencil figures shown in the margin were, so far as they are in my handwriting, simply my reduction of Mr. Halsted's figures to index form. I have not been held responsible for preparation of this—only for the mere division through to put it in index form.

1452 Plaintiff's Exhibits 31, 32, 33, 34, 35, 36 and 37 admitted in evidence.

1453 *Re-Direct Examination by Mr. Goldstein*

I think I have made all the explanation that I care to make as to table 4 of City's Exhibit numbered 95. The period of time covered by Plaintiff's Exhibit 37, in the New York case, was from 1914 to 1920, inclusive.

Irving Fisher's book is named "Making of Index Numbers." There are 526 pages. The whole volume deals with the weighting of index numbers.

1454 CYRUS G. HILL, called as a witness on behalf of the defendants, having been first duly sworn, testified as follows:

Direct Examination by Mr. Goldstein

My name is Cyrus G. Hill. Reside in Chicago. Graduate of Yale College, 1912, with degree of Bachelor of Arts. Graduate of Harvard School of Engineering, 1914, with degree of Master of Electrical Engineering. Immediately after graduating from the Harvard Engineering School I was employed for a few months by the Western Electric in Chicago. Then in the Engineering Department, Central Group of Bell Telephone Companies, of which Mr. Wray was at that time Chief Engineer. I was with the Central Group except for the interval of two years in France during the war until 1919,
1455 at which time I left to become associated with Mr. Wray, as partner, in the firm of J. G. Wray & Co., Consulting Engineers. Since that time I have been employed on various investigations of telephone companies, in the construction plans and designs and in the operation of telephone properties.

In connection with the various investigations from the year 1920 on, I made numerous studies of the depreciation of properties of the companies of the Bell System,—some of these being made in the employ or while retained by the telephone companies, and some while retained by cities or public utility commissions. I made or assisted in a depreciation study of the Northwestern Telephone Exchange in Minnesota. I made a depreciation study for the purposes of determining the proper annual rates of depreciation on, and proper adequate reserves for, accrued depreciations for the New York Telephone Company with regard to its property both in New
1456 York City and in the State of New York outside of New York City. I made a study of the New York Telephone Company's property in the State of New Jersey which is now a part of the property of the New Jersey Bell Telephone Co. I made a similar depreciation study of the property of the

Pacific Telephone & Telegraph Co. in Washington, and similarly a study of the property of the New England Telephone & Telegraph Co. in Rhode Island, and of the property of the Indiana Bell Telephone Co. in Indiana, and of the Cumberland Telephone & Telegraph Co. of Mississippi.

In general, I am familiar with the practice and accounting methods of the telephone companies of the Bell System, relating to depreciation, retirements of physical property, salvage,

cost of removal, expense of depreciation and credit to
1457 and charge against reserve for accrued depreciation. I

am familiar in general with the methods that have been employed by the Bell engineers to estimate the annual depreciation rates on various classes of telephone plants, including their methods of computing the average life from the records of past history of the company, and their methods of estimating salvage. I have read the order of the Illinois Commerce Commission dated Aug. 16, 1923, authorizing a reduction in the telephone rates for certain classes of service in the City of Chicago.

By depreciation I mean loss of or reduction in value.

Expense of depreciation is a technical term used by tele-

phone engineers and telephone accountants, and may be
1458 described as meaning the difference between the cost

new, of a unit of plant in place in the Company's property and the salvage value recoverable at the time it is removed from service, less the cost of removal. It is customary for telephone accountants to spread that amount evenly over the estimated years of life of the item of property, and the expense of depreciation commonly means the part of that total loss of value assigned to any one year.

There are two methods commonly used for measuring expense of depreciation. One is to divide the total loss in value, that is, the difference between the original cost and the net salvage throughout the years of life of the property, assigning an equal amount to each year. That is known as the straight line method. Another method in common use consists in determining that amount which if set aside annually with interest accrued at a given interest rate and compounded,

usually annually, will produce at the end of a number of years, of the estimated life of the item of property, an amount equal to the difference between its original cost and the net salvage.

The latter method is known as the Sinking Fund Method.

1459 The Illinois Bell Telephone Co. uses the straight line method. The expense of depreciation estimated annually is included in the Company's operating expenses. It is charged to an account called "depreciation of plant and equipment," which is commonly included with the maintenance account, but a small part of the expense of depreciation is charged to clearing accounts, that part being the portion assignable to the general equipment account, such as stable, garage, equipment, tools and implements, and accounts of that sort. From these accounts this part of the expense of depreciation finds its way both into the operating expense account and into the construction account. At the same time that expense of depreciation is charged to operating expense accounts, a similar amount is credited to the reserve for accrued depreciation, which is a fixed capital liability account. When an item of plant, such for instance, as a pole, is purchased and placed in the telephone company's property, placed in service, a charge or an addition is made to the appropriate fixed capital account, in this case exchange pole lines, equal to the cost of the pole and the cost of installing it. When this item of plant for instance, this pole, is retired from service, a credit or a deduction is made from the appropriate fixed capital account,—in this case, the exchange pole line account, and at the same time a charge is made against the reserve for accrued depreciation, equal to the original cost of that pole in place. At the same time a credit is made to the reserve for accrued depreciation representing the salvage to be realized on that pole. If that pole is capable of reuse in another location, the salvage credited to the reserve for accrued depreciation, is equal to the current cost new of such a pole. The reserve for accrued depreciation is charged with the cost of the removal of the pole.

The purpose of these accounting practices as regards the expense of depreciation and the depreciation reserve is to ac-

cumulate in the depreciation reserve during the period of service life of each unit of property an amount equal to the original cost of that unit, less its net salvage.

1462 The amount of money corresponding to the expense of depreciation goes into the general funds of the company. It is not ear-marked in any way, and it is not distinguishable by the company. It is held by the company as any other money, but may be regarded as finding its way into the additions and betterments to the company's property. At the time of retirement of any unit of plant, the company should have in its assets account, an amount resulting from the functioning of the depreciation reserve which is equal to the original cost of that item of property, less the net salvage. If the expense of depreciation is such, that it has accumulated in the reserve, an amount equal to the original cost less the net salvage, then the company in its assets
1463 account, at the time of retirement of that unit should have that amount of money on the books. It is the purpose of the expense of depreciation that that condition should exist to the time of the retirement of the unit of property.

The reserve for accrued depreciation at a given time, represents the accumulation of the expense of depreciation, accumulated for each item of plant then in service from the beginning of its service life down to the time in question. In order that it may fulfill the purpose which I have described, the amount of the balance in the accrued depreciation account at any time should be such that that balance, plus the expense of depreciation accumulated during the succeeding years, against the items of plant then in service, will be equal to the original cost of the plant then in service less its net salvage.

1464 If no other additions were made to the existing property, and the further additions to depreciation reserve consisted only of the annual expense of depreciation for properties then in existence, the depreciation reserve would be reduced to zero at the time that the last item of the then existing property was retired from service.

If, for any given class of plant, such as pole lines, the annual depreciation rate and the estimated average life, and the estimated salvage and rate of growth are known, the amount which should have been accumulated for that class of plant in the depreciation reserve can be determined approximately. In order to determine accurately the required depreciation for a given class of plant, it would be necessary to know
1465 what the retirements of the present plant were going to amount to during each year of its remaining life in the future. That cannot be determined from a knowledge of the average life. In order to determine that, it is necessary to know, in addition to the average life, what percentage of the property placed in a given year is retired at each year of its age. In other words, one must know the mortality habits of that class of plant.

The proper depreciation reserve can be determined approximately by the determination of a curve of mortality, representing the retirement of each class of plant at each year of its age, which represents approximately the mortality experience of that class of plant. Such mortality curves are based usually upon the mortality data which has been accumulated by the telephone companies, particularly companies of the Bell System, which shows, for various items of plant, when they were in place and when they were taken out of service. That data can be compiled and analyzed in such a way as to show the mortality experience that a given class of plant has.

The annual depreciation rate is based on the esti-
1466 mates of average life and net salvage for any given class of plant. The gross salvage less the cost of removal expressed as a percentage of the original cost of the plant retired is deducted from 100% and the remainder is divided by the numbers of years of average life. The result is the annual depreciation rate.

If the estimated average life is shorter than a true average life of the plant, and if the estimated salvage is lower than the true salvage, then the resulting depreciation rate will be higher than the true rate of depreciation of the property. If too

high a depreciation rate is used, the result is too high an expense of depreciation. If the expense of depreciation is higher than it should be over a period of years, the reserve
for accrued depreciation will, in that case, become
1467 larger than is required to provide for the original cost
less the salvage of the property retired, at the time of its retirement. If the annual charge for expense of depreciation is too small, the result will be a deficiency in the depreciation reserve.

To compute the correct amount of depreciation reserve it is first necessary to compute the probable retirements, of the existing plant, which will occur during the successive years throughout its life. It is done by the use of a mortality curve or table showing the mortality experience of the plant, either derived directly from experience or made on the basis of a reasonable assumption and then by the use of the current depreciation rates, the expense of depreciation which will be accumulated through the remaining life of the present plant is determined.

This accumulated expense of depreciation plus the existing depreciation reserve should be equal to the orig-
1468 inal cost of the existing plant less its estimated net
salvage; and by a process of successive trials we reach a point where that equality is arrived at and we have obtained a correct amount of the depreciation reserve.

If the existing depreciation reserve is found to be too large by this method, it indicates that the annual depreciation rates are too high. Either they have been too high over a period in the past, or the estimate of rates for the future is too high. I think the size of the depreciation reserve is a direct indication of the adeqaucy or excessive nature of the annual depreciation rates. I am familiar with the draft of order of the Illinois Commerce Commission dated August 6, 1923, case No. 11,984, on which the following statement appears.

"The details as to how this large reserve has been built up will require a rather lengthy explanation. One example

shown clearly in this record is the manner of accruing depreciation on station apparatus. The company has adopted what is known as a straight line method in all its depreciation accounting, and for station apparatus has determined as a basis that the life of such apparatus is five years, and that the salvage to be realized from such apparatus at the end of its life is 65 per cent.

By the use of these factors the Company has built up as of December 31, 1922, a depreciation reserve amounting to $3,991,467.00 or 51 per cent of the investment which was at that date $7,825,805.00."

I have made a computation to determine what the balance in the depreciation reserve for station apparatus should have been as of December 31, 1922. It should have been approximately 15% of the book cost. The 15% was comparable with a reserve of 51% of the book cost which had actually been accumulated as of December 31, 1922, through an operation of the credits and debits to the depreciation reserve account as stated in the Commission's order. The excess in
1470 the reserve for depreciation for station apparatus as of Dec. 31, 1922, amounted to 36% of the book cost of the station apparatus or approximately $2,800,000.

In my computations of the required depreciation reserve, I assumed that the average life of station apparatus was five years and the net salvage 65 per cent, for the purpose of the computation, those being the average life and salvage figures testified to by Mr. Hale, as shown in his exhibits, and I further assumed that the average rate of growth of station apparatus was 5 per cent per annum, this being the average increase in the number of stations for the years 1920, 1921, 1922 and the first seven months of 1923.

I further assumed a distribution of retirements by the age of the station apparatus in accordance with the so-called normal probability curve.

1471 This 36% estimated excess in the depreciation reserve accumulated for Station apparatus as of the end of 1922 indicates, in my opinion, that the average life

of station apparatus is more than five years or that the average salvage is higher than 65% or possibly both; and the depreciation rate resulting from the use of these average life and salvage figures is substantially too high. I did not get what I thought should be the approximate depreciation rate on station apparatus. I am familiar with the following part of that same order of the commission appearing on page 17:

"The facts disclosed by the records are that the actual salvage recovered on station apparatus for the eleven year period ended 1922 was 92 per cent of the cost of such apparatus. The record shows, as a matter of fact, that the life of station apparatus is in excess of five years, and it appears that 6.8 years is the most accurate estimate of station apparatus in one location."

1472 I have computed the required depreciation reserve as of December 31, 1922, on the assumption that the average life is approximately seven years and the salvage 92% of the cost of station apparatus. This computation indicates that the required depreciation reserve would be about 3% of the book cost of the station apparatus as of December 31, 1922. Under those conditions the excess in the depreciation reserve accumulated against station apparatus would be 48% of the book cost or $3,750,000. I have examined a part of the data reported to underlie Plaintiff's Exhibit 19 introduced by Mr. Hale which shows the average life,
1473 salvage and depreciation rate for each class of plant as of the year 1923. I found the data to consist of a part of the figures for each class of plant and purporting to represent the gross additions, retirements, book costs and salvage for the years from 1921 back to 1911 and in some cases net additions, retirements and book costs from 1911 back to approximately 1900.

There was a determination of the average life of practically all of the classes of plants made from this data by the company.

The method used by the company for most of the classes

of plants was the so-called turnover cycle method for determining the length of average life.

This method consists of starting with the retirement for the year 1921 and adding to it the retirements for successive preceding years until the accumulated retirements become equal to the book cost of the last year added.

Now, according to the usual use of this method the number of years whose retirements are included in the total, is taken as the average life of that class of plant.

I found that the Illinois Bell Telephone Company also used a further method of analysis which consists in accumulating the gross additions backwards from the year where the accumulation of retirements stopped, to a point where the accumulated gross additions equal that same book cost, that is, the book cost at the year where the accumulation retirements stopped.

They then find the central year for the group of gross additions and the central year for the group of retirements and the interval between these two years is considered the
1476 average life. I illustrate the application of the turnover cycle method as used by the Illinois Bell Telephone Co. as follows: If all of the station apparatus placed in 1913 were retired in 1917, and all of the station apparatus placed in 1914 were retired in the year 1918, and so on through successive years, the average life of station apparatus
1477 would obviously be four years for the spread of time between the time it was placed and the time it was retired. In that case the plant in service at the end of the year 1917, would consist of all the gross additions of plant added during the years 1913 to 1917, inclusive, but would not include any plant placed before 1913, since that would all have been retired. Consequently the sum of the gross additions from 1913 to 1917 inclusive, would equal the book cost at the end of 1917. Now, similarly, the retirement from 1917 to 1921, inclusive, would equal that same book cost as of the end of 1917. Assuming the gross additions and retirements to have been made uniformly, each year, the center year for the gross ad-

ditions would be 1915, and the center year for the retirements would be 1919, which would give you a difference between the two center years of four years, indicating an average life of four years. This illustration is not the way that
the property is actually placed and retired in the com-
1478 pany's plant. In the example I cited, the assumption
was made that all station apparatus placed before 1917 would be retired before 1921, and that all the station apparatus placed during the years 1918 to 1921, inclusive, would be in service at the end of 1921. This would be true only for every item of station apparatus, if every item of station apparatus had a life of exactly four years. Now, it is a well-known fact that the lives of the various items of any class of plant, vary considerably even though the items may appear identical when they are placed in the plant. Some have very short lives and others have lives about the average, and others have very long lives, or, comparatively long lives, so that there is a distribution of retirements by age about to an age corresponding to the average life.

The turnover cycle method does not give correct results when the lives of the various items comprising a given class of plant vary. The turnover cycle method then indicates too short an
average life, the amount of the error being greater, the
1479 greater the dispersion of the mortality curve. The
greater the variation of the average life or lives of the various items from the average life, the greater the error in the turnover cycle method. Also, the greater the rate of growth, ordinarily the greater the error in the method. I have made an estimate of the amount of this error in the turnover cycle method. In the case of Exchange and Toll Lines, I assume an arbitrary but entirely possible distribution of retirements by age, about the average life, and I have compared the average life based on its typical mortality distribution with the average life derived by the company by the use of the turnover cycle method. I have prepared a chart which shows the assumed distribution of the ages of poles at the time of retirement.

(City Exhibit 96—marked for identification.) Referring to

City Exhibit 96, and assuming that the poles in Chicago were retired in accordance with this chart, I find the average
1480 life of the poles to be 15 years. The curved white line shows the percentage of the total plant placed at any given time, which is retired during successive years of age in service. The mid-point of that curve is 15 years. Its spread is from one year to thirty years. That means that some of the plant would be taken out after one year of service—more after two years—and so on. The greatest amount over 15 years and then decreasing amounts until some would be taken out after twenty-nine years of service, giving zero plant remaining at thirty years.

By the turnover cycle method, the company determined the average life of poles to be 9.7 years.

I have made a similar comparison for exchange underground cable, using the symmetrical curve for the distribution of retirements similar to the one shown for pole
1481 lines. (Exhibit 96 for identification.) The average life of the exchange underground cable would be seventeen years. The result of the turnover cycle method as computed by the company was 14.8 years.

I examined the company's working papers on many of the other classes of plants. I found in the working papers of the company that the same turnover cycle method had been used for many of the other classes of plants, and that the
1482 conditions in other classes of plants, as regards the plant placed and retired and the book cost of various years, were similar to the two classes that I have mentioned. I took copies of the company's data on these other classes but I made no computations of my own except on these two classes of plants. I examined part of the data which underlies the company's depreciation rates which were in effect in the years
1924 and 1925. I found that the turnover cycle method was again employed for the computation of the average life
1483 from the company's history, but with this difference—whereas, in 1921, the gross additions, retirements and book costs were used directly as they were obtained from the company's records, in the 1924 study the gross additions, re-

tirements and book cost for the successive years were converted by means of index numbers to a uniform price level before the application of the turnover cycle method.

In both of these studies, 1921 and 1924, the salvage was determined by converting the plant retired and the salvage recovered in each year, as shown by the company's books, to a uniform price level. The average ratio of the salvage to the book cost was then obtained as representing the percentage of salvage, based on historical conditions.

I think that the average life and salvage derived from figures converted to a uniform price level do not form a sound basis for the determination of the company's expense of depreciation. According to the company's accounting
1484 methods, salvage is credited to the depreciation reserve at current price levels, either for the re-use of the items again in the plant or for the credit allowed for the material by the manufacturer, the Western Electric Company usually, whereas the plant retired is charged against the depreciation reserve at its estimated original cost.

This estimated original cost is, in the case of most of the classes of plant, determined by taking the average book cost at the time of retirement, this average cost being obtained by dividing the book cost, say poles, for instance, by the number of poles in service.

The salvage credited to the reserve is so credited at a higher price level than the plant retirement charged against the reserve, and this will continue to be true as long as prices continue to rise, and will further continue to be true for some time after the prices have ceased to increase, due to the fact that it takes some time for the average book cost, which is used as the original cost of plant retired, to catch up
1485 with the changes in price levels. If the expense of depreciation is estimated by using the salvage, determined by reducing the original cost of plant retired and the salvage recovered to a uniform price level, the result must necessarily be an accumulation of too much in the depreciation reserve, because the salvage credited to the reserve will

continually be higher than the salvage allowed for in the depreciation rate.

The same condition exists to a somewhat less extent in the determination of average life, if retirements, additions and book cost are reduced to uniform price levels. The reason for this is that the function of the expense of depreciation and the accumulation of depreciation reserve is to meet the retirements of the dollars on the company's books rather than the retirement of the physical units of plant in the field. The average life which should underlie the company's expense of depreciation, if the company's present accounting methods are to be followed, is the average life of the dollars which are put on the books when the plant is placed in service.

1486 Now if the price levels vary, if the plant is taken out of service at a higher price than it went in, then there are more dollars per unit of plant written off the books than were written on to the books, and the life becomes slightly shorter. If the price level has gone down, then there are fewer dollars written off of the books and the average life of the dollars on the books, corresponding to the various units of plant, is longer. In order that the depreciation may be computed correctly, therefore, both the average life and the salvage should take account of the expected relation of current price levels during the immediately succeeding period of years to the original cost price levels, or the average book cost price levels.

1488 (Mr. Bangs states that plaintiff's position is that it is bound to follow the accounting rules of the Interstate Commerce Commission and the Illinois Commerce Commission.)

I think they have not followed the rules of the Interstate Commerce Commission, by accruing more depreciation than is currently accruing in the property.

1491 I am depreciating the original cost of the property. The question I have in mind is as to the method of computing the average life of that original cost, and if the price level has changed through the history during the last few

years, unless a correct method is applied, you will not get the depreciation of the original cost but you will get something else.

1492 As an example, assume a length of cable in the City of Chicago, which was placed in the year 1918 at a cost, we will say, of $1,000 for the material and $200 for the cost of installation, making the total original cost of installation $1200. Now assume further that this cable becomes inadequate and has to be removed in the year 1928 on account of the growth of the City and other cable required in its place; we will say that the company correctly estimated the

1493 average life of that cable at ten years, and that the salvage was estimated at 20 per cent of the original cost in place, that being the net salvage. This would give a depreciation rate of 8 per cent. Now, assume that in the year 1928, the price of copper and lead has increased so that the Company actually recovers at the time the cable is removed in 1928, 40 per cent of its original cost. Now, the accounting entries would be as follows: In the year 1918, the fixed capital account for exchange aerial cable will be increased by $1200, the original cost of that cable. In the year 1928, when the cable is removed the fixed capital account for exchange aerial cable will be decreased by $1200 or the original cost of the plant retired. Now, during the ten year period 80 per cent of this $1200 will have been accumulated in the depreciation reserve, 8 per cent a year for ten years, or, $960.00 will have been accumulated in the reserve when the cable is removed and a charge or deduction is made against the depreci-

1494 tion reserve of $1200, the original cost of the cable, and at the same time the depreciation reserve is credited with the salvage recovered which we assume was recovered at 40 per cent of the original cost or $580.00, so that the total reserve available against the retirement of that cable is $960.00 accumulated from the annual rates, plus $580.00 net salvage or $1540; but the charge against the reserve to equal the amount by which this capital account was decreased when the cable was retired is only $1200, so that the reserve is ahead $340, or $340 of excess exists in the reserve. Now, I

assume that the average life was correct at ten years; the excess in the reserve thereby results from the incorrect estimate of the salvage.

In the year 1918 the salvage recoverable, we will say, was actually 20 per cent of the original cost of the cable, but in the year 1928, due to change in price levels, the salvage recoverable was 40 per cent of the original cost of the cable. A correct determination of the salvage would have made a forecast of this change in price levels and if the forecast had
1495 been accurate, the depreciation rate in 1918 would have been based on a life of ten years, but on salvage of 40 per cent, or 6 per cent annual depreciation rate, which would have accumulated the correct amount in the reserve, and the excess of $340 would not have accumulated.

It is not possible to determine exactly the course of prices over a period of years, but the trend of prices can be determined and the company does actually, and in many cases actually there have been, approximate forecasts made on the trend of prices. The point that I am making is that it is better to make an estimate on the probable relation of price levels, to give weight to that in the depreciation rate, than it is to base the rates on constant price levels reducing the factors to the same level of prices. The other extreme of course, is to give no effect to any changes in the price level except those which have occurred in the past. In other words, it is to use the salvage just as it is shown historically on the books,
1496 and in case of rapidly fluctuating prices that is not correct either. In a period of sharply declining prices the depreciation rates would have to be higher, that is, if the company foresaw a declining of prices the depreciation rates would have to be increased somewhat because the salvage recoverable would be less than it would at the uniform level of prices. It works both ways. If the decrease in prices was just enough to make the salvage recovered at the same price level as the original cost of the plant placed, then you would be correct in using a uniform price level as a basis.

1497 I have examined Plaintiff's Exhibit 19 and the data underlying it. From my examination of Exhibit 19 and

the data underlying it, and my experience with reference to depreciation of telephone plant and telephone equipment, I believe that those depreciation rates are not correct. I believe they are substantially too high—that is, they are substantially higher than the depreciation actually accruing in the property. I believe the expenses for depreciation for the years 1923, 1924 and 1925 are also too high. 15% of the
1498 total reserve as of Dec. 31, 1922, is represented by the reserve on station apparatus. I have made a computation as to what percentage the entire reserve should be of the book cost of the depreciable property as of Dec. 31, 1922. The computation is the basis in part of my conclusion. I also based my conclusion on my experience and on similar compu-
1499 tations and other depreciation studies which I have made. I have available the study that I have made. The basis of this computation is on my general experience. It is my opinion that the depreciation reserve, as a whole, as of Dec. 31, 1922, should not have been in excess of 23% of the book cost of the property. It was 30% (as shown by the books).

I made a study of a similar character in connection
1500 with the reserves in the New York Telephone case.

The percentage of reserve of book cost of the property of Illinois Bell Telephone Company in the Chicago Exchange was as follows: In 1922—30.44%; in 1923—29.26%; in 1924—28.83%; and in 1925—28.14%. The 23% which I just stated as my opinion was applicable to 1922. My opinion as to the years 1923, 1924 and 1925 would vary slightly depending upon the property added and retired, and in about the same way that the company's depreciation reserve varies.

The excess in the depreciation reserve can serve no
1501 useful purpose except to meet the losses incurred by the company in the retirement of its property, and if the depreciation rates are maintained at a point where they are equal to the depreciation currently accruing in the property, then these current rates in the future will take care of the losses as they occur, and the excess in the reserve can be used for no useful purpose but will continue to exist in the reserve.

A reduction in the annual depreciation rates for the future will operate to reduce the excess in the reserve. I have read that part of the order of Dec. 20, 1920, Plaintiff's Ex-
hibit No. 18, beginning on page 19, headed "Depreci-
1502 tion," and running to the top of page 22. I find in this order on page 21 the following:

> "The Commission finds from the evidence that additions to the depreciation reserve in excess of actual requirements for replacement should not be made under present conditions and that an allowance of $2,000,000 plus 4 per cent of the net annual addition to plant made hereafter, will be adequate to provide for the necessary reserve for depreciation as to the property of the company devoted to furnishing service in the City of Chicago."

If that order were put into effect the result would be to decrease the excess in the depreciation reserve.

I have made computations of the allowance for annual depreciation which the company should set aside if the order
of December, 1920, were carried out in the years 1921 to
1503 1925, inclusive. City Exhibit No. 97, for identification is such a computation. The Commission's order as to depreciation accounting becomes effective as of July 31, 1919, so I used that as a starting point. In my opinion it would take about five years from 1921 to reduce the reserve to substantially normal by applying this order. The annual rate of depreciation actually set aside on the company's books exceeded the amount necessary to comply with
the order of 1920 as follows: In the year 1921, the ex-
1504 cess was $961,824; in the year 1922, $1,084,178; in the year 1923, $1,231,863; in the year 1924, $1,093,633; and in the year 1925, $1,274,092.

I am familiar with the order of Aug. 16, 1923, issued by the Illinois Commerce Commission, and with the provisions therein for maintenance and depreciation. The provision in that order as to maintenance and depreciation would result in a

reduction of the excess reserve for depreciation. In my opinion the excess reserve for depreciation in 1923 was
1505 $6,000,000 for the Chicago Division.

1506 City Exhibit Nos. 96 and 97 admitted in evidence.

1507 *Cross-Examination by Mr. Bangs.*

I believe that there are some inaccuracies in the use of the turnover cycle method. The inaccuracies in the use of the turnover cycle method result from the fact that certain assumptions necessarily underlie it, which are not in accordance with the actual way in which the telephone property is retired. In the original, or perhaps I should say in the older method of applying the turnover cycle method, which consisted in accumulated retirements until the sum of those retirements equalled the book cost as of the earliest year of the accumulations, that method would be subject to errors unless it were assumed that all plants of the class in question were retired at the same age.

In the later method of application, which I have described, that of determining the central year of additions and central year of retirements, the method would be subject to inaccuracies unless it were assumed that all of the additions made in a certain group of years were retired in an immedi-
1508 ately succeeding group of years which amounts to practically the same thing as assuming that the life of all units in a given class of plant is the same. If you make the necessary corrections, the turnover cycle method would give the correct life. If you were very familiar with the property under consideration, and do not make the corrections, the use of the turnover cycle method would not give a reliable indication of life because it is impossible to tell without going through computations by a different method, how much the error will amount to. Life tables based upon turnover cycle method, even if coupled with judgment and experience, would not give any reliable indication, because the amount of the error is not determinable from inspection.

I testified in the Indiana Bell case.

1509 Plaintiff's Exhibit 39 marked for identification.

Plaintiff's Exhibit 39—"Exhibit Number 86. Case Number 7670. Depreciation study Indiana Bell Telephone Company. J. G. Wray & Company, Engineers"—was prepared under my direction. I testified as to the truth of that exhibit and the accuracy of the results obtained thereby before the Federal Court in the Indiana Bell Telephone case. It shows on table No. 1, Depreciation Rates for the Indiana Bell Telephone Company. It shows a composite rate of 6.01%—for station apparatus 7.8%. The first column of table No. 2 shows what is sometimes described as a "life table"—

1510 that is, the average life in years. The second column is per cent of salvage. It is not a proper part of a life table. The life and salvage must be determined to get the rate. It is a life table to the extent it shows the life in one column. It is a salvage table to the extent it shows the salvage in another column. It is a depreciation table to the extent it shows the depreciation in one column. I determined that the station apparatus of the Indiana Bell Telephone Com-

1511 pany had an average life in years of 4.5 years and a per cent of salvage of 65%, and a depreciation rate of 7.8%. In determining the average life of station apparatus in that study I used the symmetrical mortality curve method. Back of the symmetrical curve used in the case of station apparatus, was an arbitrarily assumed distribution of retirements—about an average. As I recollect it in this study, all of the mortality curves which formed the basis of these computations were arbitrarily assumed. They were originally developed in

1512 connection with other studies where mortality data was available. Part of what I took was all the retirement data that I could secure of the Indiana Bell Telephone Company from the time it was organized as a company. I also took what information I could secure on retirements from the company when it was a portion of the Central Union Telephone Company. I used the retirements and book costs and gross additions to check against one another in order to de-

termine the correct gross additions during those years. I used the gross additions in connection with this mortality curve method to determine the average life.

1513 In that exhibit (Plaintiff's Exhibit 39) I set up the gross additions in a column—each gross addition opposite the year in which it was made. I then take a mortality curve of arbitrary length, that is, I guess at what would probably be the average life and computed from it the percentage of each year's gross additions which would be surviving at the end of the year of the study which was 1922 in this case. By multiplying each year's gross addition by the percentage which should survive, if that mortality curve represented the history of that class of plant, I obtained the amount of plant surviving at the end of 1922 corresponding with each year's gross additions. By adding up these amounts of surviving plant, I arrived at a computed book cost. I then compared this computed book cost as of the end of 1922 with the actual book cost as shown by the company's books of the same date.

1514 If the two agree, then I conclude that the mortality curve I had chosen represented approximately the actual history of that plant. If the two did not agree approximately, then I assumed a mortality curve of a somewhat different length, and repeated the method until I obtained results which did agree. I did not make any study of the actual mortality of the plant from the books of the company to make a mortality curve. I assumed various mortality curves. If they tested in with the actual retirements, then I said I had determined the proper curve for the life. I used gross additions and book cost.

Questions by Mr. Goldstein.

Data to make a study of mortality tables from the books of the company were available in the case of the Northwestern Telephone Company in Minnesota; also in the New York

1515 case. Such mortality data were not available for the Indiana property.

Examination continued by Mr. Bangs.

From a knowledge of the retirements as shown by the companies' books and by taking assumptions as to the mortality curve of the plant, it is possible to determine the average life of the plant. That is what I did in Indiana. I did not mean to give the impression that the rates of depreciation set forth in Plaintiff's Exhibit 19 were the exact rates of depreciation resulting from the turnover cycle data found in Mr. Hale's working papers. I compared the difference between the average life and the salvage values which had been determined by Mr. Hale by the turnover cycle method with the average life and salvage values used in Plaintiff's Exhibit 19.

1516 I compared the average life figures more carefully than the salvage value figures. I have the comparison of certain classes of plant. I didn't compare them all. The turnover cycle method showed the average life of 10.51 years as the Central Office Equipment.

1517 The 1921 table shows ten years. The turnover cycle method showed 3.87 years for station apparatus. The life table showed five years. Exchange pole lines by the turnover cycle method showed 9.7 years, the actual life used—13 years. Exchange aerial cable by the turnover cycle method showed ten and the actual life used in Exhibit 19 was 14.

1518 Aerial wire showed 8.2 under the turnover cycle method—actual life use—7. In this record, the actual life of some kinds of wire was seven years and some kinds something else and the longest fifteen years. As to underground cable, the cycle method showed 14.8 and the actual use 24 years, that is 20 years for subsidiary and 25 for main underground cable. The item exchange pole lines includes also toll pole lines.

1519 The life table shows exchange pole lines 13 years and toll pole lines 16 years as compared with the 9.7 on the turnover cycle method. I think the toll aerial wire was combined with the exchange wires and treated together and they show 8.21 years for the two. It shows three different lives for three different kinds of toll aerial wire—11 years for the

iron wire, 18 years for the copper wire and 20 years for load coils.

1520 I think there was no turnover cycle for underground conduit. Toll underground cable was combined with the exchange underground cable and given a life of 14.8 years for the two.

I have referred to salvage studies found in Mr. Hale's data but they are not included in the use of the turnover cycle method. That refers only to average life. I have no criticism of the salvage tables except the general criticism that I was discussing, that is, the effect of increasing prices.

The general trend of prices entering into the construction of telephone properties since 1910 was gradually upward until about 1919 when there was a sharp increase until about 1921 or 1922 at which time there was some decrease. I am 1521 not positive in just what years the sharp curve occurred. As I remember it, the decrease came along about 1922 and was not very substantial, that is, there was a slight decrease whereupon prices again started upward and have fluctuated. Some equipment prices went down substantially. Central Office and station apparatus along in 1926 or about that time—and prices have remained fairly constant since then. There has been some recent increase in copper.

1522 I say that unless salvage is estimated on a sound basis by the Company in determining its depreciation rate, the result will be either an excessive amount in the depreciation reserve or an insufficient amount in the depreciation reserve depending upon whether the estimation of salvage has been high or low. By sound basis, I am taking into account so far as possible, past and future fluctuations in prices. It is very probable that if the estimate were made in the very best of judgment upon a sound basis, that on some type 1523 of plant, some 10, 20 or 50 years later, the estimate would prove wrong. If the estimate on salvage is too high, the result would be a deficiency in the reserve. If the estimate were too low, there would be an excess in the reserve. Referring to City Exhibit 96 entitled "Assumed Mortality

Curve, Exchange and Toll Pole Lines Based on 15 Year Average Life," I assumed for the purpose of illustration that the mortality of the toll and exchange pole lines would be in accordance with this curve, that is, that this curve would represent the relative distribution of the age at retirement of the various units of property at about the age representing the average life, that is, assuming a life of 15 years in the first instance.

1524 All units of property would be retired as separate units, the retirement falling in each year of age as shown on this curve. It might be called a normal mortality curve. It is a normal probability curve. It is a symmetrical probability curve. I did not find any data in the books of the Chicago Telephone Company to substantiate my assumption that the actual mortality of the company's exchange and toll pole lines would be in accordance with this curve.

1525 I did not look for any. I found that this curve for an average life of 15 years averaged in with the company's actual experience as regards its gross additions, retirements and book cost. Using that method in the Indiana Bell Telephone Co. case, the computed book cost agreed with the actual book cost as of the end of 1920. The form of the curve was assumed and not based upon data from the company's books. I did not make what is known as a mortality curve study of these items of plant in connection with my testimony on the depreciation rates of the Chicago Exchange.

1526 I asked if I could have access to the company's mortality data and was told that Mr. Hale had been instructed not to give it to me. The company's books would not give the data necessary to compile such information. I understand it to be a refusal of the company to give me access to all the records to make my own mortality study. I asked for access to the mortality data, which would be the company's records which were in such form the data could be obtained or the result, either one.

1527 (Mr. Bangs made statement that company is preparing mortality data for Interstate Commerce Commission

which were not made until after 1925 and the City was refused access to them unless the court ordered it but that witness could have access to the company's books at any time.)

What is actually known as company books would not give data necessary for a mortality curve. You have to use some of the departmental records running back over a period of years. Evidently there was a misunderstanding.

1528 It would take a long time to make a mortality study in connection with the Chicago Exchange. I used a similar curve in connection with the exchange underground cable to which I have testified but I did not draw the curves. I used data from the curve. That kind of a curve would be the same but of a different length. It would still be a normal symmetrical curve. That was not based upon this company's records.

I was with the Illinois Bell Telephone Co. from the fall of 1914 to the spring of 1919 except for the time I was in
1529 the army; with the National Guard in Texas during one summer and in France almost two years. I had three or four years' experience with the company in the engineering department of the Central Group working on what was known as the transmission and protection engineering. The scope was really broader than would be indicated by that title.

At the time I was in the employ of the company, I was in a number of the company's buildings in Chicago. I have not inspected them since. I don't know how many buildings the company had in 1923 without looking it up. Don't know how many were fireproof and how many were non-fireproof.

1530 I am not familiar with the company's Central Office Equipment in the years 1923, 1924 and 1925 except in a very general way. I know the company has some switchboards and in a general way what offices were converted to automatic. The Central Office equipment is located in the company's various buildings throughout the City. I have used the company's station apparatus very frequently, my own and in other places. I have seen the book records of

those classes of plant which were made available to me by Mr. Hale showing gross additions, retirements and book costs over a long period in the past.

1531 I am not familiar with the company's exchange pole lines, aerial cable, aerial wire, exchange underground cable or toll, underground cable from actual inspection except to the extent I have seen them in driving around Chicago. As to recent years that is true also as to the toll plant. Prior to 1919, I made some inspection of toll lines, toll cables in various parts of the property. Taking the telephone plant as a whole, the principal cause of retirement in the City of Chicago is obsolescence and inadequacy, to a minor extent, wear and tear.

By inadequacy, I mean the growth of the demand for telephone service which has been so great that the existing plant has been unable to meet it and it is either necessary or economical to remove the existing plant and put in plant of larger size of different classes of plant.

1532 If we have rapidity of growth in telephone property, we would expect a large amount of inadequacy only on the assumption that the engineering was a constant factor. If the growth is foreseen, the engineering department would provide for the plant originally a place for the larger growth. Consequently, the plant would not become inadequate any more than in a lesser plant where there had not been that larger growth.

In a general way, I am familiar with the fundamental plan system of the Bell Telephone companies of protecting the growth by very thorough studies and then basing their engineering upon that fundamental plan. I would not say that the property which grew the most rapidly would probably have the greater amount of inadequacy. The assumption of greater inadequacy would be true if the growth exceeded the engineers' estimates of growth. In that case, the inadequacy would

1533 take place more rapidly. The inadequacy would depend upon what the engineers' plans were and how long a period in the future was taken into account. I have no defin-

ite judgment as to the proportion of the expense of depreciation which is a result of inadequacy. I really could not say whether wear and tear was less than one-half of the expense of depreciation. I have never seen any data bearing on that point. I have not sufficient knowledge of actual operation and management of telephone properties to arrive at a conclusion, on a study of that character except to the extent that I stated that I thought inadequacy and obsolescence were the major factors in depreciation and that wear and tear was of less importance.

1534 In my opinion it would not be possible for a person who has been in the telephone business for 20, 30 or 40 years and who had seen replacements of property made under his supervision and knew the reason for such replacement to have a reasonably accurate judgment as to the proportion of replacements that were caused by inadequacy as compared to wear and tear unless he had made a study to determine that roughly. I believe that such a rough determination could be made but in the ordinary course of conducting business I don't believe that anybody, no matter how long he had been in the business could give the exact proportion or approximately exact or even a fairly exact estimate of the relative importance of those factors. I doubt whether he could guess within 10%. I really don't know whether he could guess within 20%—possibly he could.

Assuming that a group of men were continually engaged in study of data bearing on depreciation and expense, making studies from the company's books, from the turnover cycle method, studies from the company's books based upon the mortality curve method, studies based upon the company's actual experience in building, experience of other concerns in building, in other words accumulating continuously the knowledge of the past experience of the company, I think it
1535 would not be possible, as a result of such work to determine within 10%, the reason why the property as a whole is replaced. For certain classes of property, I think it could be. In the case of building I think that could be determined fairly

accurately. In the case of poles it would be more difficult. In any event, it would require a special study for that purpose, which differs from the studies customarily made by the Bell Telephone Company to determine the average life of property. What they are usually interested in is how long the property lasts, regardless of what caused the retirement, or that is what they have been interested in in the past. And without a special study of the company's construction estimates, to gather such data as might be shown as to the cause of removal of the estimated plant to be removed, I don't believe an engineer would have a very definite idea. That is not very important under the present accounting system.

The principal causes of removal of property due to the cause which is defined in the accounting rules as wear and tear or rust rot and decay are the action of weather and
1536 the elements, electrolysis in some cases. Buildings are affected by rust and decay.

From my experience in Chicago, the reason for abandonment of buildings has been inadequacy and obsolescence. By obsolescence I mean the replacing of non-fireproof buildings with fireproof. I do not know of any well built building that was abandoned because wear and tear had terminated its life. There have been buildings abandoned because they were in such bad shape they were untenantable; I think some in
1537 Chicago in the Loop. I know there are some old buildings in the Loop where the floors are sagging and everything out of square.

I think there are cases where modern buildings constructed in the last thirty years such as the type the telephone company constructs in Chicago for its Exchanges have been abandoned simply on account of wear and tear. I think, perhaps wear and tear combined with the fact that the tenants of the
1538 building require a different type of construction are causes for abandonment of a building or replacement of the building by a new building. I can think of a number of old buildings thirty years old, where the plumbing gets out of order and the electric light wiring gets out of order and the general appearance gets bad.

Central office equipment wears out in some places, so does station apparatus. That is the item that is sent back and made as good as new by the Western Electric Company and then put in, in different places.

1539 That property is subject to some reuse, I think probably it might be reused twice. I doubt whether it would be used three times as an average. I think I know of a cable that has actually worn out, if you include electrolysis.

1540 There has been electrolysis in Chicago in the underground plant. I do not know exactly the location. There have been a number of surveys and studies made in Chicago to investigate it. I know as a general thing it was thought there was damage being done to the underground plant by electrolysis. I do not know of any case in the City of Chicago where the underground cable has been removed because of electrolysis; I haven't any definite information on the subject at all. The usual cause for removal of cable is inadequacy.

1541 I cannot answer definitely for the City of Chicago whether any conduit has been removed on account of wear and tear. There is no reason why clay conduit should wear out. Private branch exchanges, station apparatus, central office equipment, poles—both exchange and toll—are the only items which might wear out to any appreciable extent.

1542 A booth will wear out and special fittings become so unsuitable, it has to be replaced. Iron wire and cover drop wire deteriorates and has to be removed on account of wear and tear. Copper wire may deteriorate when it is subject to the action of certain fumes, that is not frequently, however. Of course, the general equipment accounts, the automobiles and tools and implements, office furniture and fixtures and such classes of plant, certainly wear. Interior block wires wear out.

1543 The size of the depreciation reserve is an indication of the adequacy or excessive nature of the annual depreciation rates. An excess in the reserves might be due to the

depreciation rates in effect several years before the time in question, and those depreciation rates might have been modified.

1544 Notwithstanding the amount of the reserves at any given time the depreciation rates in effect at that time might be proper rates of depreciation. I think I stated in my direct testimony that the amount of the reserve was an indication either that the rates had been too high in the past, or were now too high, or both. It is possible that the present rates would be absolutely proper and at the same time have an excessive amount in the reserve. It is also possible to have an inadequate amount in the reserve with proper present depreciation rates. The determination of proper rates of depreciation depends upon the proper use of the average life and the salvage value of the property.

Referring to the order of the Illinois Commerce Commission showing a reserve of 51 per cent for station apparatus, as of December 31, 1922, the company does not, to my knowledge, carry any separate reserve on its books for station apparatus. I did not make any independent determination or estimate of a reserve for station apparatus. I took the figures from the Commission's order.

(Plaintiff's Exhibit No. 40 "Computation of Normal Depreciation Reserve Ratio" marked for identification.)

Plaintiff's Exhibit No. 40 shows the method of computation which I have used. I want to make a correction on that copy. There should be a percentage sign on the last figure—14.478.

1546 This table shows in the first column the years of age running from one to eleven. Assuming that the mortality experience of station apparatus is in accordance with the normal probability curve, an example of which was introduced this morning as Exhibit No. 96, that is in accordance with a normal probability curve indicating an average life of five years, which is the Company's estimate of the average life of station apparatus, then the percentage of plants placed at

any time, or the percentage of station apparatus, placed at any time which would survive the various years of age, is as shown in the second column; that at the end of the first year of age there would be 99.5 per cent of the original plant remaining; 0.5 of one per cent of the plant would be retired during the first year of its life. At two years of age there would be 97½ per cent surviving, and so on.

If the station apparatus has been growing, at the rate of 5% per annum for a period of a few consecutive years, the plant will settle down to a stable condition in which this second column of figures represents the proportions of the plant of each age.

1547 In other words, the plant in existence at the end of 1922, would constitute or consist of 99.5 per cent of plant one year of age and under; 97½ per cent of plant two years of age and under, and so on, which represents the distribution by age of a stable plant.

If the plant is not growing and if the additions are equal to the retirement, so that the rate of growth is zero, over a period of years, then the plant will settle down into a distribution by age, as shown by the second column.

Now, the next two columns represent the arithmetic of taking account of the rate of growth of 5 per cent so that if the plant is growing continuously at the rate of 5 per cent per annum, the distribution by age of the plant in existence at the given moment is represented by the third column from the right, the column headed, "Distribution by Age." That is based on a 5 per cent rate of growth.

1548 Now, the next column, the second column of figures from the right represents the required or normal depreciation reserve as to percentage of the plant in service of various ages from one year to eleven years, again based on this normal probability mortality curve, distribution of retirements.

That column of figures is easily checked. It simply means that if you take the percentage there shown, of the plant in

service, as represented by the next column to the left, of corresponding age and then add on the expense of depreciation, which would be accrued during the remaining life of that plant, you come out with the amount equal to the plant shown in that column, indicating distribution by age.

For instance, taking the relative figure, .005 next to the bottom, that represents a relative amount of plant of ten years of age which will be retired in the next year.

The depreciation standing against that should be 90 per cent, or 90 per cent of .005, is .0045 in the reserve; and that decimal .005 of plant has on an average half a year to live since it will be all taken out during the next year, and consequently it will accumulate 10 per cent, there being no allowance for salvage thus far.

1549 In the figures, the depreciation rate is 20 per cent a year, or 10 per cent in a half a year. 10 per cent of decimal figure .005 is .0005, which added to .0045, gives you .005, the amount of plant to be retired, and shows that the amount of reserve at the end of the tenth year plus the depreciation which will be accumulated during the eleventh year is sufficient to retire the plant of ten years of age.

The same sort of check may be made of each figure, of each percentage of depreciation reserve up that second column.

Now, the amount which should stand in the depreciation reserve, expressed in terms of relative figures is obtained by multiplying depreciation reserve expressed as a percentage of plant in service of each age, by the relative amount of plant in service of that age, which gives the column of figures immediately on the extreme right.

The sum of that column of figures is the total amount which should stand in the depreciation reserve against the total of the third column from the right, the column headed, "Distribution by Age;" so that the amount which should
1550 stand in the reserve against 7.298 of plant is 3.019, of depreciation reserve, provided there is no salvage.

Assuming the salvage to be 65 per cent of the book cost, which is the Company's estimate of salvage as shown on their Exhibit 19, the amount of plant which has to be provided for by the reserve is 35 per cent of the book cost, 65 per cent being taken care of by the salvage.

The depreciation reserve ratio, or the ratio of reserve to book cost is therefore 35 per cent of the ratio of 3.019 to 7.298, or 14.478 per cent. 14.478 per cent depends upon the amount of salvage realized or expected to be realized. The computations shown on Exhibit No. 40 depend for their accuracy upon the assumption of the normal mortality curve of the form shown in Exhibit 96; of that form, but not that length. It is a symmetrical curve.

I did not make any determination of the actual mor-
1551 tality curve for station apparatus. This in general is the method I have used to determine the amount which should be in reserve for the total property. It is the method for most of the classes of plants which I used in the New York case.

My opinion is that the mortality curve method, and in that connection also, the turnover cycle method, is not particularly well applicable to buildings and Central Office equipment, and so in the New York case I used the New York Telephone Company's provisional estimate for the retirement of their Central Office equipment and buildings in future years as a basis of the amount of reserve instead of computations based on any curve.

Those are the principal exceptions. I think there were other classes of plants in which a slightly different method may have been used, but I don't remember—that is the method used on substantially all of the classes of plants.

1552 I did not say in my direct examination that the basis of my opinion as to the amount that should be in reserve of the Illinois Bell Telephone Company for its Chicago Exchange was based on a study of the station apparatus account as shown in the Plaintiff's Exhibit No. 40, and the studies made of other companies.

I said my opinion was based on a computation made for the Chicago plant and upon my experience with similar computation for other plants, but not on the computations for station apparatus. I had a computation on the Chicago plant but not in typewritten form. It is a work sheet.

1553 This document, Plaintiff's Exhibit No. 41, marked for identification, is the document I referred to as forming in part the basis of my judgment as to the adequacy of the reserve of the Illinois Bell. The heading, "Rate of Growth Equals 11 Per Cent Per Annum," means that is the average rate of growth of the Chicago Telephone Company's property for a period of years prior to 1922. "Average Life Equals 13 Years," is a composite average life of the Illinois Bell Telephone Company, Chicago property, as obtained from the depreciation rates and the average life figures shown in the Plaintiff's Exhibit No. 19.

1554 "Salvage Equals 36 Per Cent," is a composite salvage as obtained from the depreciation rate and salvage figures shown in the Plaintiff's Exhibit No. 19 representing the composite salvage of the Chicago plant according to the estimates made by the Illinois Bell Telephone Company.

The columns from left to right across Exhibit No. 41 correspond to the columns from left to right across Plaintiff's Exhibit No. 40. They were arrived at by the same method. In the preparation of Plaintiff's Exhibit No. 41, I used an assumed mortality curve; it was a symmetrical curve such as that shown in Defendant's Exhibit No. 96. I do not think that I testified in my direct examination that due to the increase in the price of telephone apparatus the Com-

1555 pany realizes an excessive amount of salvage over that estimated.

I do not remember that statement as regards station apparatus. That is true of any type of plant if the prices are increasing. During the period from 1914 to 1919 when prices were increasing, the company would realize an excessive salvage unless it, in 1914, anticipated the increase in the prices

of material. The effect of that would be to increase the amount in reserve on the assumption that they had not foreseen any increase in prices and had not allowed for any increase in depreciation.

1556 In compiling Plaintiff's Exhibit No. 41, I made no adjustment for a rise in the prices, from 1914 to 1919. That would be a part of the excess in reserve, as I testified. The rise in prices has no relation to the amount which should be in reserve. The amount which should be in reserve, as I have computed it there, deals with the amount required to retire property over a period in the future, irrespective of
1557 any change in prices except such as may be reflected in the salvage figure which I used. What I mean is, that the company made certain adjustments of their costs and their cost level prices in determining the 65 per cent salvage. In my direct testimony I said the Company reduced the original cost of plant retired and the salvage for the various years in the past to the same price level. That was in both studies. The adjustment of cost levels for the life of plants, determining the average life, was made only in the 1924 study. I think it is true that during the war there was substantially a smaller amount of plant replaced than there was during normal years. That fact would not have any relation to the amount that should be in reserve. The determination of the amount
1558 which should be in reserve starts with the end of the year 1922, and looks forward and not backward. The amount that was actually in reserve at the end of the year 1923 would be affected by the factor of deferred replacement during the war to the extent that it had not been compensated for by replacements after the war.

Exhibit 41 does not show the actual reserve at all. It shows the reserve which will be needed in order to take care of the plant in the future, upon the basis of a normal mortality curve, and the assumption of a continuation of the rate of growth for the years preceding 1922.

Referring to Plaintiff's Exhibit 40, when a piece of
1559 station apparatus is reused in a different location, the depreciation account is credited with the cost of a new piece of station apparatus; that is the salvage. The salvage will approximate perhaps 90 per cent of the original cost, assuming that the price level is constant. The only charge to depreciation reserve account at the time of the reuse of station apparatus is the charge for supply expense. I believe the cost of removal is charged to current maintenance. If some piece of apparatus is reused a second time, the salvage credit will again be in the neighborhood of 90 per cent of the original cost. The charge against the reserve will be the original cost of the station apparatus.

1560 The net charge to reserve will be supply expense. In these two reuses of station apparatus we have charged against reserve, only the supply expense involved in each reuse.

During the period that this property has been in the plant, the depreciation reserve account has been accumulating by the amount of the monthly charges for depreciation. For that particular piece of plant, as far as it has been taken, the only off-setting entries against that, have been the two credits for supply expense. If after the second use, the property becomes incapable of repair and realizes a junk salvage of 7 per cent. the reserve account would be charged with the original cost of the piece of apparatus and would be credited with the net salvage, which is 7 per cent.

1561 For that particular item of property up to the time it has become no longer useful, the reserve account is accumulating by monthly charge to the reserve account. There are no credits to reserve account except the supply expense and the reserve account is not balanced until the property becomes no longer useful.

I gave consideration to that factor in the preparation of Exhibit 40, only to the extent to which that factor is given

consideration in the company's figure for salvage on station apparatus, which is 65 per cent.

1562 I did give further consideration to it, in that I made further analysis of the situation and found that no further adjustment was necessary. My recollection is that my depreciation study in Indiana, referring to the Company's Exhibit 86, which is the Plaintiff's Exhibit 39, was made in 1923, possibly 1924.

To the best of my recollection, the following questions were asked and I gave the following answers in the case of the Indiana Bell Telephone Company state-wide investigation, beginning November 16, 1925, No. 7670, before the Indiana Commission:

"Q. Any further explanation that you deem necessary in connection with this Exhibit 86, Mr. Hill?

"A. I think that covers the principal points in the exhibit.

1563 "Q. Have you made any later examination of the books and records of the Indiana Bell Telephone Company, since this study was completed in order to ascertain whether the depreciation rate for each class of the Company's depreciable property has changed since the date of your study?

"A. Yes, I have examined the gross additions, net additions and book cost of the Company for the years 1923, 1924 and 1925 down to date. I do not find any very marked departure from the general experience of the Company during the preceding years; that is, there are no large differences since the end of 1922, which would cause any radical change in the average life, as we determined it in 1923. There would be, of course, some variation, that is, if we made another study carrying it up to the end of 1924, or to the middle of 1925, we would obtain some differences in the average life, but in my judgment those differences would not be large, so that the depreciation rate at the present time would not vary

very much from the depreciation rate that we found in 1923.

1564 "Q. Can you express in terms of percentages, taking for that rough purpose a composite rate as to how much it might run below or above, giving the limit in your opinion beyond which it could not run either way?

"A. The rate which we found was approximately 6 per cent. My judgment would be that the actual rate found now would probably be perhaps anywhere between 5.7 and 6.3 As an outside limit of the variations I would say it would not be more in any event than probably, perhaps 5.5 per cent, as a lower limit and 6.5 as to the upper limit.

"Q. In your opinion, Mr. Hill, are these rates of annual depreciation for the several classes of plant as stated in your Exhibit 86 representative of the experience of the Indiana Bell Telephone Company for the time in which the study was made?

"A. Yes.

"Q. And that of its predecessor, the Central Union Telephone Company with respect to the property in Indiana?

"A. Yes, that is true."

1565 In that case I was testifying for the Indiana Bell Telephone Company and my testimony was based upon a mathematical study of the books and records of the company as set forth in Plaintiff's Exhibit 39 for identification.

The testimony I have given in this case for the City of Chicago is not based on a determination of the actual mortality curve studies of the property of the Illinois Bell Telephone Company. I am not trying to compare this with Indiana.

1566 (Plaintiff's Exhibits 39, 40 and 41 admitted in evidence.)

1567 *Re-direct examination by Mr. Goldstein.*

The study made for the Indiana Bell Telephone Company was based on assumption to the extent that the distribution of retirements by age of the various classes of plants was assumed to be in accordance with this normal probability curve, and was based on the actual experience of the Company as regards the determination of the length of life of the various classes of plant. Only the shape of the curve of mortality was the assumption. The length of the curve was derived directly from the Company's records of its history of plant retirement and gross additions and book cost.

1568 The same thing is true with reference to my study of the Illinois Bell Telephone Company in this case. I made tests to show the substantial accuracy of the depreciation studies based upon the use of normal probability curves as compared with the results obtained from the use of the Company's actual mortality experience.

I made such tests in certain classes of property of the New York Telephone Company, where the actual mortality data was available, and was analyzed, to show the extent of the mortality curve for that class of plant.

I then determined the average life using that actual mortality curve, which was slightly askew, and not symmetrical, and also by the use of the symmetrical and normal curve and I found that there was a fairly good agreement between the two in every case.

Among the factors that would make a different depreciation rate for the same class of plant in different companies, would be the size of the community in which the plant was
1569 placed, the weather conditions, the condition of the soil, the rate of growth of the various communities, the way in which the plant was engineered and the grade of maintenance and whether or not the property were a combination of competitive plants in the same community, which would require the elimination of certain duplicate plant.

I found different rates in the Indiana Bell studies compared to the study here in Chicago.

1570 The rates in Indiana were influenced by several factors, peculiar to the Indiana situation. One of such factors was the fact that the property consisted partly of plant taken over from the Central Union Telephone Company which was in poor condition; the maintenance of the Central Union property was not good because of the competitive situation in Indiana, and poor maintenance tended to shorten the life of the plant; and also, there was considerable duplicate plant in process of elimination due to the fact that in many of the exchanges there had been two companies
1571 which were merged into the Indiana Bell Telephone Company and this duplicate plant was being taken out gradually by the Indiana Bell Telephone Company.

Re-cross Examination by Mr. Bangs.

As I remember it, the following questions were asked and I made the following answers thereto in the Indiana Bell Telephone case in my direct testimony:

"Q. In determining your annual allowance, what did you take into consideration besides the study of the books?

"A. Probably nothing. The basis of this study is the books of the Company, only in the case where a judgment figure was required because the records did not show sufficient data to serve as a basis of computation and only where such a judgment figure was introduced, that instead of the true fact in connection with this."

1572 "Q. Now did you take into consideration anything else than that which is disclosed by the books when you were making this study?

"A. Not unless there have been recently very radical changes in the character of the plant or the policy of the Company which would tend to make the future differ radically from the past experience.

"Q. Have there been any of those radical changes?

"A. No.

"Q. In the past five years?

"A. No. We could see no reason for making any deviations from the result of experience, except in the cases which are mentioned.

"Q. In other words, then, these lives you have set out in table 2, you say reflects the actual experience of the Company from the study you have made of it?

"A. Yes. Can I make an explanation in connection with that question?

"Q. Yes, if there is any explanation to make.

"A. They represent the actual experience of the Company.

Of course, the actual experience is more definite in the
1573 more recent years, that is, the records of the Company were less exact as you go back. However, that is not a serious drawback inasmuch as the weight or the effect in the result of the figures for gross additions in the early years is small as compared with the gross additions in the later years. You notice in all these exhibits, take Table 9, and there is an asterisk—'gross additions estimated from net additions prior to 1909'—that covers the first question which you asked me in regard to those early figures."

Re-direct Examination by Mr. Goldstein.

In connection with the actual experience, I stated in my testimony in the Indiana Bell case, a part of the actual experience of the Company that I took into account in my studies, was that they retired a lot of this badly managed property, badly maintained property of the Central Union. That was all reflected in the Company's book figures, which I used.

1574 The same was true of duplicate plant. It was reflected in that experience.

J. G. WRAY, called as a witness on behalf of the defendants, having been first duly sworn, testified as follows:

Direct Examination by Mr. Haight.

My name is J. G. Wray, and I reside in Glencoe, Illinois. I am the senior member of the firm of J. G. Wray and Company, Consulting Engineers with offices in Chicago, Illinois.

1575 I am a graduate of the University of Wisconsin in Electrical Engineering, Class of 1893. Since that time I have been continuously engaged in the engineering profession.

In 1893 I entered the service of the Chicago Telephone Company, now the Illinois Bell Telephone Company, and was engaged with that company successively as cable tester, chief of laboratory, assistant Chief Engineer, in the Engineering Department, then as Chief Inspector, Assistant Superintendent of Maintenance, Electrical Engineer and Superintendent of Equipment in the Operating Department, then in about 1902 I was appointed Chief Engineer of the Chicago Telephone Company, and continued in that position until my resignation in 1916.

In 1911 I was Chief Engineer of the companies constituting the Central Group of the Bell Telephone Companies, namely, Chicago Telephone Company, now the Illinois Bell Telephone Company, Wisconsin Telephone Company, Michigan State Telephone Company, Cleveland Telephone Company, and the Central Union Telephone Company.

I continued as Chief Engineer of the Central Group until November, 1916.

1576 During most of the year 1914 and the early part of the year 1915, acted as Chief Engineer for the receivers of the Central Union Telephone Company for a period of about one year.

In my practice as consulting engineer, which has been con-

tinuous since November, 1916, I have been employed by the Public Service Commission of New York on several cases involving rates of the New York Telephone Company in New York City and throughout the state.

I served the Public Utility Commissioners of New Jersey in a case concerning the rates, valuation and service of the New York Telephone Company, in the northern half of New Jersey, and of the rates, valuation and service of the Delaware and Atlantic Telegraph and Telephone Company in the southern half of New Jersey.

I acted in behalf of the Department of Public Works and the Attorney General of the State of Washington for the cities of Seattle, Spokane and Tacoma, in an investigation of telephone rates of the Bell companies in that territory.

I was employed by the Public Utilities Commission of Pennsylvania and of Massachusetts, in connection with 1577 state-wide rate cases; was employed by the Attorney General of the State of Mississippi in a state-wide valuation and rate case; by the cities of New York, Buffalo and Syracuse, New York, Chicago, Los Angeles, California, Toronto, Canada, Providence, Rhode Island, and Cleveland, Ohio, on investigations relating to telephone operations and valuations particularly as affecting rates.

The foregoing represents some of my principal engagements on the public side of telephone rates and valuations.

During the same time I have been employed by a number of Bell and Independent companies, namely, the Southwestern Bell Telephone Company, the Northwestern Bell Telephone Company, the Indiana Bell Telephone Company, the Manitoba Government Telephones, the Alberta Government Telephones, British Columbia Telephone Company, the Home Telephone & Telegraph Company of Fort Wayne, Indiana, the Tri-State Telegraph & Telephone Company of Minnesota, the Western Electric Telephone System of Iowa, and a number of other companies, all of which involved investi-

gations relating to rates, property valuations or operating methods.

1578 For a period of about a year, I was assistant superintendent in charge of plant and traffic operations in the City of Chicago. At present, I am president of an operating company operating in a number of states.

I heard Mr. Sloan's testimony on the subject of wholesale and piecemeal construction. Referring to Mr. Sloan's testimony, he said: "A large part of the 25 pair cable is put up under routine estimates, and most of the 600 pair cable is constructed under specific estimates, yet if you did both of them under either kind of estimate the relation of the labor to the material would be the same. It is simply because of the fact that you do a large part of your work that
1579 involves small material or low cost of material under the routine estimate.

If you were reproducing the property as an entire new job you would have the same relation between labor and material for each size of cable, so there is no element of piecemeal injected into the thing at all."

I say that his conclusion is not in line with my experience and observation. I have made studies of the relative cost of construction under large or specific estimates and small or routine estimates. We made an analysis of the cost of
1580 labor on a given class of property when done under the large jobs or specific estimates and when done in small jobs or under routine estimates in conection with the New Jersey Bell Telephone Company in the latter part of 1922 or early part of 1923. I have an opinion based upon my experience and knowledge in this general field as to the labor cost in large and small jobs.

1583 In my opinion the labor costs per unit of plant are very much higher under piecemeal construction, or—stated in another way, under work done on routine estimates, as compared with work done in a large way under specific estimates.

That opinion is based upon my personal experience as

Chief Engineer of the Chicago Telephone Company for many years, and upon analyses of cost of other companies that I have made since I left the Bell service. I have prepared or had prepared under my direction the results of the study made in reference to the New Jersey property of the New York Telephone Company. City Exhibits 98, 99 and 100 for identification are tables upon which are set out a computation to show the labor hour cost of exchange aerial cable as a whole and of exchange aerial cable under specific estimates and under routine estimates.

Exhibit 98 includes all estimates, specific and routine for the exchange aerial cable construction during a period in the latter part of 1922 and the early part of 1923. My recollection is that it covers the last six months of 1922 and the first nine months of 1923.

The first column of Exhibit 98 shows the items of plant considered under the exchange aerial cable account. The first item is 51 pair 19 gauge paper insulated cable. The next item is 101 pair 19 gauge paper insulated cable. The next item is 152 pair, and so on, down to the terminals.

The first item under terminals is No. 14, 11 pair and the next item is No. 14, 16 pair, and the third item No. 14, 26 pair.

Now, in the second column, headed "Quantities of Material" are listed the number of feet, or the number of items installed during the period investigated.

1586 The specific estimates analyzed in this computation were numbers 2288, 2301, 2331, 2353, 2354, 2363, 2370, 2380, 2381, 2395, 2397, 2401, 2405, 2409, 2410, 2411, 2414, 2442, 2443, 2445, 2452, 2459, 2469, 2393, 2512.

1592 City's Exhibit 99 is a computation of those parts of City's Exhibit 98 that relate to performance under specific estimates.

City's Exhibit 100 relates to the data of performance under routine estimates. The two being combined in City's Exhibit 98, which covers all specific and routine estimates. Referring to City's Exhibit 98, the first item is a 51 pair 19 gauge paper insulated cable. There were 83,369 feet of this cable placed

under the specific and routine estimates together, during a period consisting of the last six months of 1922 and the first nine months of 1923.

1593 The next item, in the third column, is .1104 labor hours; this being a trial unit of labor hours to place a foot of 19 gauge cable.

The next item 9,204 hours, is found by multiplying .1104 labor hours by 83,369 feet of cable.

Now, the last figure I can best explain by going through the process to the end, if I may.

Taking the second item and each item thereafter, we go through the same process, arriving at a computed number of labor hours found in the next to the last column.

These items for all of the items total 112,906, as found in the third figure from the bottom of the next to the last column.

Now, an analysis of the estimates show that the actual labor hours required for placing all of these items of property was 140,663, which is 124.58 per cent more than the computed hours found through using the trial units.

Then to compute the actual labor hours for placing each item of property, we multiplied the trial units, shown in the third column, which is the middle column on the page, by 124.58 per cent, arriving at the last column, which, for the first item, is .1375 labor hours; this being the actual labor hours required or used by the company in placing a foot of 51 pair 19 gauge cable.

1594 The same scheme is followed in City Exhibit 99 except that the subject matter relates only to specific estimates. The same is true of City Exhibit 100 except there we are taking into account only routine estimates. From the material appearing on all of these exhibits, the result can best be shown by making a few comparisons.

That process was followed for each one of the items in the table.

The average labor hours for placing a foot of 51 pair 19 gauge cable are found to be .1375, as shown at the top of the

last column in Exhibit 98. The labor hours for placing a foot of 51 pair 19 gauge cable under specific estimates was found to be .1055, as shown at the top of the last column in Exhibit 99. And in the same way the labor hours for placing a foot of the same cable, the 51 pair 19 gauge, under routine estimates, was found to be .2003, as shown at the top of the last column on Exhibit 100.

Similar comparisons could be made for each one of
1595 the several items and show that, roughly, the labor hours for placing these items under routine estimates is practically twice as much per unit as under specific estimates.

City Exhibits 101, 102 and 103 are the same sort of a study except that it relates to exchange underground cable. The figures are to be read in the same way as in Exhibits 98, 99 and 100. Exhibit 101 relates to specific and routine estimates combined. Exhibit 102 relates to specific estimates. Exhibit 103 relates to routine estimates.

1596 The studies as appearing in these exhibits confirm the opinion that I have expressed, that the labor cost of placing items of property in small quantities, as is done under routine estimates, is substantially higher than it is in placing the same items of property under specific estimates. It is the difference between the cost of doing work on a piecemeal basis and in a large way.

I would like to make this observation with respect to data of this kind obtained from another company, as applying to the Chicago Company.

The routines and standards, the methods of preparing specific estimates and routine estimates, the way of doing the work, are all pretty much alike among different Bell companies, and all Bell companies have both specific estimates and routine estimates covering large jobs and small jobs, respectively.

1597 I heard Mr. Turner's testimony to the effect that price levels were approximately constant during 1923,
1924 and 1925, but have since dropped about 12%. I do not

agree with his conclusions. I have prepared a tabulation showing price levels on typical items during those years.

(City Exhibit 104, marked for identification.)

1598 City's Exhibit 104 shows a comparison of prices of materials for the years 1923, 1924 and 1925, reduced to a percentage basis, taking 1923 at 100 per cent.

This comparison includes metal products, building materials and payrolls obtained from reports of the Department of Labor of the United States, and certain items of materials used in telephone plant, such as poles and wire equipment, obtained from prices which we obtain currently from jobbers.

Taking 1923 as a base at 100 per cent this exhibit shows that metals and metal products in 1924 were at a price of 97.3 per cent of the prices prevailing in 1923. That is shown in the second column. And in 1925 metals and metal products were at 94.4 per cent; both years being substantially below the price level of 1923.

1599 Building materials, taking 1923 at 100 per cent, were found 94.1 per cent in 1924 and 93.6 per cent in 1925.

Manufacturing payrolls, as reported to the Department of Labor, taking 1923 at 100 per cent, was 90.7.

(Plaintiff objects to testimony and to introduction of Exhibit 104. Objection overruled.)

The next item under telephone material is the Northern cedar poles F. O. B. Gemmill jobbers. Gemmill is a
1600 shipping point in Minnesota, from which most of the cedar poles are obtained and from which the freight rates are computed.

The first item is 25 feet 5 inches, being the size of the pole. Taking 1923 at 100 per cent we find that the 1924 price is 75 per cent and the 1925 price 70 per cent.

The next item is Northern cedar poles F. O. B. Gemmill jobbers. The 35 foot 6 inch size, which in 1924 was 83.3 per cent in 1925 67.7 per cent of the 1923 price.

The next item is the 35 foot 7 inch pole; the next 40 foot 7 inch; next copper wire; next galvanized iron wire; next 92

jack switchboard manufactured by the Western Electric; next 49 jack switchboard, also manufactured by the Western Electric; these being the two types of manual common battery switchboard, commonly used by the Bell companies. The 92 jack board is in use in Chicago. There may be some of the 49 jack boards, I think, although I am not certain of this.

1601 City Exhibit 2 entitled "Overhead Expense Charged to Construction August 1, 1911 to June 30, 1923", is an exhibit prepared for us by Mr. Sloan; an exhibit in which he sets out the overhead found in the gross additions to the company's plant for the last five months of 1911 and for each year thereafter until June 30, 1928.

The first column, marked "A" shows the gross additions, including the construction work in progress for each of these periods.

The next column, marked "B" shows the engineering costs included in "A".

The next column "C" shows the general expense costs included in "A".

The next column "D", shows the interest during con-
1602 struction items or costs included in "A".

The next column "E" shows gross wiring gain.

The next column is the sum of "B", "C", "D" and "E" and the last column is the difference between the first columns, "A" or the gross additions, and the sum of these overheads included in columns "B", "C", "D" and "E", stated in column "F."

As to the figure $1,455,367 at the bottom of column 2, I have worked out a percentage that that is of the direct cost of construction. That figure is for the years 1920 up to June 30, 1923. These engineering costs which represent the most recent experience of the company in its engineering are 4.27% of the gross additions made during the period. By gross additions, I mean the details shown in "Column A" less the overheads.

1603 The general expense $178,899 is found to be .52 of 1% of the direct cost of construction for this period.

The interest during construction for this 3½ year period $623,929 was found to be 1.83% of the direct cost of construction for the period. I understand these percentages are based upon the actual experience of the company—some of these percentages for overheads would be more and some would be less, if we assumed the plant were built in a wholesale way in a single operation.

To illustrate, the item of interest during construction would be substantially greater for a reproduction of the plant on a wholesale basis than it is actually on a basis according to the company's experience in taking care of normal growth. The general expense will be more for the reason that the administrative costs are now divided between the operating function and the function of constructing the property.

1604 Those costs would all go against the construction of the property on a reproduction cost basis. The engineering cost would be less for the reason that under the company's actual experience it is continually adding small additions to a working property. It is necessary to fit these additions to the existing plant, to the working plant. The engineering costs on a wholesale basis would be less than those experienced under actual conditions of today.

I have assumed in the reconstruction of the plant that the relationships existing between the A. T. & T. Co. and the Western Electric in regard to engineering, the relationships of the Chicago Company with the A. T. & T. Company and the Western Electric Company should measure the engineering and other services, from the supplying function of the Western Electric Company, under which the Chicago Company is able to obtain its materials and supplies when and as needed, to the relation with the A. T. & T. Company, under which it can obtain money when and as needed, will all tend to make the job easier than if the company did not enjoy these contractual relations.

1605 It would have an effect upon the time required for reconstruction for the reason that the A. T. & T. Co.'s engineering and other services will enable the Chicago Com-

pany to prepare its plans more quickly and more cheaply; for the reason that it will be able to finance its jobs more readily; for the reason that it will be able to get its materials promptly and in adequate amounts to carry on the construction in the most economic way. By "economic" I would mean the period of time in which all things considered
1606 the job can be done with the maximum financial advantage.

Under my definition of economy, it is my opinion that the company could rebuild this property in a wholesale way and attach the business in a period of five years as of 1923. In my opinion the five-year period should result in smaller overheads than in a nine-year period, as used by Mr. Sloan. I mean smaller in percentages and that would mean smaller in totals.

In a general way Mr. Sloan predicated his estimate
1607 of overheads on a construction program from which he made his interest during construction computations. It is my recollection that for the other items going into his overhead costs he assumed percentages which, in his opinion, were applicable. He included in his reproduction cost as an item, all omissions and contingencies, a total of something over $550,000, this being the item of omissions and contingencies included in the Byllesby-Arnold appraisal of the property in 1911. Mr. Sloan has carried that item into his 1923 total reproduction cost. That is an item which we would ordinarily include in the overheads. He had included it in the direct costs of construction.

In my opinion, Mr. Sloan has not been consistent in his so-called reproduction cost estimate. To obtain the direct cost of reproduction in the reproduction estimate he has first eliminated from the Byllesby-Arnold appraisal and from the gross additions for the last five months of 1911, and from each year thereafter until June 30, 1923, all of the overheads. To the remainder he has applied conversion factors intended to raise these book costs and appraisal costs to the 1923 level of
1608 prices. In doing that he has raised to the 1923 level of prices all of the piecemeal costs, all of the costs of earl-

ier construction resulting from engineering, operating practices and methods, materials, and standards, less perfect than those in effect in 1923.

He has included in his 1923 reproduction estimate the effect of labor costs under organization less perfect than in 1923. He has included labor costs of workmen who did not have the advantage of labor-saving machinery and tools and methods as perfect as those in 1923.

I am saying this because I know there is progress in the art; that the services of the A. T. & T. Company are such as to make the job easier and cheaper as time goes on. Now, to that sort of an estimate of direct costs Mr. Sloan adds overhead computed pretty much on the same basis as he would do, or as I would do, for overhead on a straight out reproduction cost estimate.

I don't call Mr. Sloan's reproduction cost estimate a reproduction estimate at all. I think of a reproduction estimate as one involving an inventory of property, to which are applied unit costs representing the latest practice in construction methods; costs of the job done in a wholesale way at current material prices and current labor costs, taking into ac-
1609 count all of the most modern machinery, tools, methods, organization, everything that goes to make the job cheap and good.

Now, in the reproduction cost, as Mr. Sloan has estimated it, and for the overheads which he computes on another basis, he might have applied conversion factors to the book cost overhead if he had been consistent. He did not do it that way. To the reproduction cost including overheads he applies a going value, which he estimates in a more or less conventional way. It is largely the pricing out of items, as we would price out an inventory of the physical property. He has priced out the cost of attaching 657,000 telephones, and the cost of training a few thousand employes, and the cost of setting up a few thousand forms. Those items go largely to his going value estimates and are the usual methods of estimating a reproduction cost but quite different from his computation of the direct cost of placing the items of physical property.

Broadly speaking, I think his method of computing going value is reasonable. It is one that is often used. In his application of the method, however, I would have a number of criticisms.

1610 The going value estimate, to be consistent with his estimate of the direct cost of construction, should have taken account, not the cost of training operators and other employes in 1928, but the historical figures for training the employes, which would have been a great deal less for the company's practices in regard to training,—their routine and the training courses are more elaborate than they were in the earlier years. In fact, during the earlier years there was no training at all, and it was only within comparatively recent years that the company had established a training department for the plant employes.

Mr. Sloan computes the cost of excess spare plant, and in doing that he uses a method which I would criticize.

In Mr. Sloan's program for reconstruction of the property, there comes a time when he is ready to install telephones, and installs 20,000 telephones the first month. Now, he estimates the number of operators necessary to handle the 20,000 telephones, and in doing that gets the average num-

1611 ber of operators,—the average number of telephones per operator, according to the 1923 experience. In 1923 there were experienced operators, and he figured that those operators would serve on the average, 68 stations each.

Now, he assumed that because his operators in the reproduction of the plant were inexperienced that he would require 810 operators to do the amount of work done by 294 operators, experienced operators, necessary to serve the 20,000 stations. If the company requires 810 operators, it will require an equivalent number of switchboard positions. If it required only 294 operators, it would require fewer switchboard positions and a smaller central office. Mr. Sloan's estimate of 294 operators to serve 20,000 stations during the first month is predicated on 1923 experience, and 1923 calling rates.

Now, it is inconceivable to me that the initial 20,000 sub-

scribers, having ability to talk to only 20,000 subscribers, and who in 1923 could talk with 657,000 subscribers, would have the same calling rates they actually had in 1923. If they had a smaller calling rate, and in my opinion they would, they would have required fewer operators than Mr. Sloan has estimated, and so in that respect I consider his estimate is wrong.

He has over-estimated the amount of plant necessary
1612 and, hence, the amount of spare plant, and therefore the fixed annual charges on the spare plant, which goes into his going value estimate.

The facts I have just given would reduce Mr. Sloan's estimate of going value very substantially.

The non-physical costs of connecting stations are included in the company's operating expenses. They were estimated by Mr. Sloan at about $5 a station. The non-physical costs of connecting stations during the first six months of 1923 are included in the company's operating expenses. These non-physical costs of connecting stations added during the six months of 1923 are also included in Mr. Sloan's estimate of going value.

I consider there is duplication there. The company
1613 will duplicate its income if it includes these costs in its operating expenses, and also predicates a return on them and gets a return on them in the value of the property. The costs of training operators and other employes are included by Mr. Sloan in the operating expenses. They are also a factor in his estimate of going value. The costs of training were included. I consider there is duplication there. The cost of training those employes added to the force in 1923, and included in the operating expenses, and also included in the company's going value, represents duplication.

My answer is the same in regard to the costs of setting-up forms, methods and directory costs that are included in the going value item of Mr. Sloan's. The same is true as to
1614 training plant employes, maintenance employes and commercial employes.

I have facts showing the time within which telephone plants can be built in any large city in the United States. We have recently been connected with the investigation of the New York Telephone Company's values and rates. We have been connected with that investigation for seven or eight years, and we know that the gross expenditures for plant of the New York Company, in New York City, was on a very large scale; on a scale such as if applied to Chicago could well result in the construction of the plant in much less than five years. I can give the figures on the gross additions made to the plant in New York City.

(Plaintiff objects on the ground that gross additions to a going telephone property have no bearing upon the time it would take to construct a property.)

1615 The construction of the New York Telephone Company, during the period I have in mind, involved very extensive additions to the central office buildings and central office equipment. It was on account of the large number of new buildings being erected in the business district, and also on account of the fact that there had been a very large growth of business throughout the entire city, and further on account of the introduction of the panel-type machine switching equipment in New York City on a very large scale. The company in a few years increased its central office from $70,000,000 to $150,000,000, and its Central Office equipment from $20,000,000 to $160,000,000 or $170,000,000.

1616 Building a telephone plant practically contemporaneously with the rebuilding of a city is a different problem from reproducing a telephone system here in Chicago with the existing buildings. It would be a much easier problem if it did not go along contemporaneously with the building of the city, for the reason that there would be less activity of that sort in the streets; there would be less demand for materials and labor, and the job could be done more easily than if it were part of the reconstruction job of the entire city. Whether it is easier to install telephones while the building is being constructed or to put the wires in after the building is

up, would depend very much on the building. In general, it would be better and perhaps more cheaply done while
1617 the building is under construction, but that is a rather small part of the total investment in plant.

In the New York City telephone plant the gross additions were as follows:

1921	$ 29,929,724
1922	37,585,772
1923	55,900,253
1924	84,608,421
1925	48,897,686
1926	51,690,463

This is a total of $308,612,319 in a period of six years, and this construction was all in connection with a working plant under conditions more difficult than would exist in the rebuilding of a property like this in Chicago. Quite a large part was Central Office equipment and machine switching.

The net additions for the same property were as follows:

1921	$ 25,415,761
1922	31,817,062
1923	49,355,792
1924	75,376,681
1925	37,309,766
1926	38,086,643
1618 making a total of	$257,361,705

I consider that Mr. Sloan's method of converting labor costs to the 1923 wage level is not an accurate one as applied to materials, too, for the reason that it involves a comparatively few items of materials, the prices of which vary from year to year, and those items of materials, while perhaps representative, reasonably representative, of the proportion of that class of plant in the year 1923, will not be representative of the property as shown by the Byllesby-Arnold appraisal in 1911, nor of any of the years from 1911 to 1923.

The proportion of large items and small items, high priced items and cheap items, of a given class of property, vary decidedly from year to year, and as I said before, the prices, the comparative prices of those items will vary from year to year, and so index figures such as Mr. Sloan uses can be applied with accurate results and with certainty, only when you are measuring the group of items which he has selected if it is representative of the gross additions to property during each of the periods referred to, of the property in the Byllesby-Arnold appraisal in 1911, and of the gross retirements of each period between 1911 and 1923.

1619 Mr. Bangs: In connection with the testimony of Cyrus G. Hill, given today, it is stipulated that his study of the New York Telephone Company, New York City, in a case pending before the New York Commission, decided by the Commission in 1923, showed that the ratio of existing depreciation reserve to the book value of the depreciable property was 35.87 per cent as of December 31, 1920, and 33.73 per cent as of December 31, 1921, and that the ratio of the normal depreciation reserve, as he calculated it, to the book value of the depreciable property was 24.73 per cent as of December 31, 1920, and 23.28 per cent as of December 31, 1921.

Mr. Haight: By stipulation, in connection with Mr. Hill's testimony, the following questions and answers taken from page 1887 in volume 3 of the Indiana Bell Telephone Company case, from which the questions and answers were taken on cross-examination, are as follows:

"Q. If the company, the Central Union Company, or the Indiana Bell Company, bought some other company, or bought the property of some other company, or by consolidation acquired the property of some other company, the condition of the property it took over would affect the retirements after that date, would it not?

1620 "A. Yes, it would.

"Q. And the larger the amount of property taken over, and the lower the per cent condition of the property taken over, would be reflected in the amount of property

retired after that time by the Central Union or Indiana Bell, would it not?

"A. To answer your question directly, yes. Of course, as a qualification, I should say the retirements made after that time would depend on a great many things besides the per cent condition."

1621 I have an opinion in regard to the method employed by Mr. Sloan in converting labor costs to the 1923 wage levels. In converting labor costs to the 1923 level he used the same theory and the same general method as was used in converting the material costs. He assumed typical gangs for
1622 labor, as he assumed typical items of plant for materials, and then applying the wages prevailing during the years to the individuals on the typical gang, he computed conversion ratios of labor costs indices and applied them to the labor costs, as shown in the estimates of the company's actual construction costs. These labor conversion factors, or cost indices, could only convert the labor costs on the basis of wages and not at all on the basis of efficiency or actual performance. They are wage cost conversion factors and not labor cost conversion factors

That method does not take into account the changes, if there were changes in labor efficiency, nor does it take into account the varying or changing make-up of the gangs, which are necessary from the different character of the work done and from the different organization of the gangs, which the company from time to time has found to be desirable The labor cost indices also fail to take into account the economic or improved efficiency which results from the use of labor saving machinery, improved tools, better materials, all of which the company gets through the A. T. & T. services.

1623 Referring to Plaintiff's Exhibit 1, p. 131, where there appears an illustration of the use of a typical exchange pole line gang consisting of one line foreman, three line men, one ground man and one driver, which make-up is carried through the period from 1911 up to June 30, 1923, it appears that there is only one employe of the common labor class and that is the ground man. He is an ordinary laborer and not

of the expert class of linemen. In jobs requiring work on pole equipment, linemen are needed. In jobs requiring the digging of holes, and other manual labor, the ground man is required. From time to time jobs include a great deal more of digging than at other times, and so in order to have an economical labor performance, the gang make-up must be changed from time to time to meet the needs of the work. It is not reasonable, nor is it a fact, that the gang-make-up remains constant from year to year for all classes of pole line construction.

My opinion is that the gang make-up has to be made according to the work to be done and will vary for differ-
1624 ent jobs and for different conditions.

In connection with my previous answer that my estimate of time in which the plant could be reconstructed where I gave an opinion of five years, I would expect to begin delivering service to the subscribers during the latter part of the third year.

In determining the value of telephone property in my practice, I have always used the method of making an inventory of the property units and pricing those at current price levels, or at average prices. There was a time during the war when we used average prices for the reason that we did not have such confidence in the current prices, and so five year averages and ten year averages were then used. Of recent years I have always priced the units either at current price levels or, in some cases, I have taken into account the trend of prices a little bit into the future, on the theory that the valuation which was being made was intended for rates for a period in the future.

If the company whose property is to be valued has accurate maps and records, we may make a spot-check of the records
and maps against the property itself. Such a spot check
1625 is made to determine the degree of accuracy of the rec-
ord. By spot-check, I mean we actually inspect a certain proportion of the plant items, usually from 5 to 10%, compare that check of the actual items in the plant with the record of the items which the company has either in tabular

form, or usually, in maps. The amount of the spot-check will depend somewhat upon the class of property and somewhat upon the degree of accuracy which is found in the records. If a few per cent of spot checks shows the record to be accurate, we would be satisfied with perhaps less than five per cent. If a variance is found, we might and we usually would inspect as much as 10% and sometimes more. After we have made that determination, we make the inventory from the company's records and correct that inventory by the percentage of error which we have found through the spot-check. Then we get our costs from a study and analysis of the company's actual performance as shown by its estimate records and we give more weight to the costs found on the larger
1626 jobs, jobs more comparable to the wholesale basis of the reproduction plan than are the smaller jobs,—the piecemeal construction—that I have mentioned. We then apply some judgment to the unit costs which have been found, taking into account our general knowledge and experience in regard to telephone construction.

As to overheads, we analyze the company's experience. We consider the amount of time that would be taken to build the plant, the way in which it would be built, and from those considerations, and from our experience generally, we estimate percentages for the various factors going into what is called the general overheads. The amount for omissions and contingencies will depend upon the degree of accuracy of the inventory, and we usually, in making a field inventory, retake some of it with more care than usual, with extreme care, to learn if any items have been omitted. We also consider the company's performance and apply judgment as to the factor for contingencies, and allow an item for omissions and contingencies, that may vary from two per cent to, in some cases, perhaps four per cent.

From the construction program we estimate the amount of interest during construction. From a consideration of
1627 general experience, we estimate the amount of engineering administration, insurance and taxes. Those in the aggregate constitute what we call the general overheads and

are applied as a percentage to the strict cost of construction. We take into consideration the class of property, what has been called in this case, its per cent condition.

In addition to the general examination of the property as a whole, we examine portions of it very closely and examine enough of the different classes of property to establish averages which are representative of the property as a whole.

For example, for poles we would examine perhaps ten per cent, to determine the amount of rot, which is usually, of course, at the ground line; the amount of rot checks in the top of the pole; and from that examination and from a consideration of what the pole is supposed to do, the load it is supposed to carry, we estimate its per cent condition. So on for other classes of property. And, of course, careful examination of a considerable portion of the property items.

1628 When we have determined the per cent condition of each item of property, then in determining the value of the property we apply the per cent condition to the reproduction cost, and arrive at a figure which is known as the "reproduction cost in present condition." That I think is the most accurate characterization of what we do. I think it is the most exact method to be used and in most cases, it is the only method that can be used at all. As to other methods, I have in mind the method Mr. Sloan has used in this case. I have in mind the larger question of the condition of the property as found by the valuation.

1629 Another method of valuing property that has been used is cost index method using commodity price indices. That method has been used in at least one case I have in mind. I have in mind another cost index method used in which the cost indexes were those, as I recall, of a limited number of commodities—two or three of the commodities such as metals and lumber used in a telephone plant. Then there is Mr. Sloan's method which is different from either of the others. I have never heard of Mr. Sloan's method before he used it in connection with this Chicago property. I never knew of its being used before by anybody and I would like to

add, in my opinion, none of the three methods can give the reproduction cost of the telephone property. The three methods I mean are the one using the commodity prices which I first mentioned, the one using metal prices and lumber prices and the one used by Mr. Sloan. The difference
1630 between the method employed by Mr. Sloan in this case and what I have called the commodity index method is that the commodity index method is one involving the use of the Department of Labor commodity indices, which are computed from the wholesale price of, I think, about 550 items of commodities in general use. It is a very complete and comprehensive cost index. It is one that probably better than anything else will convert the purchasing power of the dollar from one year to another, because it is representative of the cost of things that we buy. It is based wholly upon material prices but because the list is extensive it, to a certain degree, will reflect the labor costs that go into those materials. I don't believe it is an actual reflection of labor costs of telephone properties or anything else.

Now, the Sloan method is one intended to convert the material prices from the basis of one year to that of another, and the labor wages from one year to that of another. He uses only a few items of materials out of the hundreds used in a telephone plant, and a limited number of items in his gang make-up of the labor.

Mr. Sloan's method is one that purports to raise the actual construction costs of a given year to the 1923 level, carry-
1631 ing to the 1923 level all of the irregularities, the inefficiency, of the actual performance to the higher level. It can't by any stretch of the imagination, in my opinion, be considered as a reproduction cost of the property. I think Mr. Sloan's method would give a higher figure than the commodity index method, because the change in level of general commodities during the years has been less, has been smaller than the change in level of the telephone construction during the same periods, during the periods covered by Mr. Sloan's estimate, and, further, because Mr. Sloan's estimate carries into the 1923 level, the piecemeal costs with relatively high labor

costs of the past, taking no account of the effect of wholesale construction, nor of the effect of economies in labor performance that have been brought about through the years.

1632 I have information regarding the company's experience in regard to recording construction overheads in its books. During the years when I was employed by the company and knew its accounting practices, there were at times certain expenditures charged to operating expenses, which, in the light of later refinement in accounting methods, are now and have been for some time charged to fixed capital, in whole or in part. I refer to the practice of the very early years of charging to operating expenses the cost of purchasing and the cost of warehousing the materials. In time the job was turned over to the Western Electric Company and it was recognized that costs of that sort should go against the materials themselves and not be charged wholly into operating expenses, and so that expense finally became charged, part of it, to fixed capital.

Engineering costs were charged to fixed capital to the extent that the work applied to fixed capital. In later years there was a refinement in the accounting methods and that took into account the cost of departments later developed; for instance, commercial engineering departments which did

1633 not come into existence until, I think, approximately in 1915 or 1916. The traffic engineering costs, which, while they existed to a certain extent for a great many years, were of relatively small importance until the recent years. They attempt, with a few exceptions, to charge the expenses according to the fact.

To say that in later years there were commercial engineering expenses and traffic engineering expenses going into fixed capital, in my opinion, is not to say there should be relatively the same proportion of costs of this character in the earlier years, because during the earlier years there was no such thing as a commercial engineer nor a traffic engineer. The engineering department was interested wholly in the plant. In the later years, when the property and business became

more complicated, it became necessary to create departments to meet and cope with those conditions, and so we have traffic engineering and commercial engineering.

In the earlier years the administration costs were all charged to operating expenses and I think it was only in comparatively recent years that the company, as a company policy, decided to charge part of the administration costs to fixed capital.

I think the true overheads in 1923 were higher than
1634 they were during the years prior to 1920. By true overheads, I mean the overhead cost actually experienced by the company. It is my opinion that the overloads actually experienced during the prior years particularly the engineering were less as a percentage of the construction cost than they were in 1923.

1635 One of the reasons that some of the overheads are absent is that they were not there to be charged. I do not mean by that there were no overheads. I don't mean to say all overheads were properly recorded on the books because as I have said in some detail, certain overheads were not recorded. In the company's experience there have been factors tending to offset the omission of overheads from the company's books. For instance, the failure of the company to record on its books, property that had been retired. That has come about by reason of the failure of employes to report plant items.

1636 I was with the Chicago Telephone Company, now the Illinois Bell Telephone Co. about 23 years. I was Chief Engineer from about 1901 to 1916. In such office, reports came to me from subordinates and from other employes of the company. They came with respect to plant operations and in regard to the property of the company as a whole. As to the question under discussion, the form of report most directly applicable was the estimate form in its various forms. That form shows in detail the proposed construction, the amount of plant to be built and the estimated cost. With that report is

a completion report, when the job is done, to show the
1637 amount of plant actually constructed, its cost, the amount of plant retired in connection with the job, and its estimated original cost.

There were two principal kinds of estimates; those covering construction jobs of relatively large size, known as specific estimates, and those covering all of the miscellaneous small jobs that were done by the Plant Department without special authorization, and are known as routine estimates.

The routine estimate is, in effect, a sort of a blanket authority to do all the work of this sort that is necessary during a period of three months.

1642 (Mr. Bangs states that the appeal of the City from the order of the Commission was disposed of six years ago.)

1644 (Mr. Bangs states that the finding of the Illinois Commerce Commission on original cost and as far as overheads are concerned is accepted by the company.)

1649 It was the practice of the company. There was a rule on the subject. The instructions were given to the plant employes in different ways during the period. In later years they were printed instructions; in earlier years they were, I think, in writing. Instructions of more recent years would be available, I think. My recollection is not very definite as to written instructions.

1651 I can speak only of the fact that the procedure in the retirement of the property was to retire the property at
1652 its original cost. Inasmuch as the company had no records of the original cost of the specific items of property retired, it had to estimate that original cost and such estimates were made by various plant people and by engineers. It is a fact that estimates of that sort—and I am basing this on my own experience—are usually less than the fact. They are usually—

(Motion of plaintiff to strike out answer on ground it is a conclusion.)

(Witness continuing) —it is a fact also that items of property some times are not reported that are actually retired.

(Motion to strike renewed. Motion denied.)

It was my answer that I found that to be a fact.
1653 It is true that in matters of that kind engineers underestimate, and some times fail to report. While I was Chief Engineer, the Byllesby and Arnold Company made an inventory, an appraisal of the property under my general direction, and they found, for example, for the aerial wire account, a value at the 1911 price level of $854,718, whereas the books on that date show $1,673,738, and the latter figure was based upon costs prior to 1911. That, on an average, in my opinion would be approximately 10% below the 1911 level. If the books had been accurately kept, in my opinion they would have shown 10% less perhaps than the appraisal. That account showed about twice as much as the appraisal.

(Motion of plaintiff to strike answer. Motion denied.)

(Mr. Bangs states that it has been stipulated that Byllesby and Arnold report is correct.)

The book costs of that time appear in the record.

1654 I heard Mr. S. A. Rhodes testify in this case in regard to the per cent condition of the property. I made a tabulation from his testimony to show the extent of his inspection of the property.

City Exhibit 105 for identification is the tabulation.

1655 I think Mr. Rhodes' inspection was wholly inadequate in respect to all but one class of property, the Central Office Telephone equipment. Of all these classes of property, there is no other class, the inspection of which I consider adequate, to determine the per cent condition of the property.

Mr. Haight: What is your opinion as to what would be an adequate inspection?

1656 (Objected to by plaintiff as immaterial. Objection overruled.)

In my opinion accurate knowledge of the actual condition of a property like the Illinois Bell Company property in Chicago could not be had by an inspection of less than from 5 to

10 per cent of each of the several classes of property, the inspection to be distributed so as to be representative of the property as a whole. Different engineers each making such an inspection as I have described might well vary from 5 to 10 per cent in their opinion as to the condition of the
1657 different classes of property. I mean classes of property as a whole—not the property as a whole.

I am generally familiar with the general price levels in the telephone industry for the years 1923, 1924 and 1925, and we have data in our office as to the prices of the different classes of material going into telephone construction. The general trend for telephone materials and equipment during those three years was somewhat downward. I can get the
1658 data. I have secured a tabulation showing the average prices of copper and lead for each of the years from 1911 to 1923. I secured the figures from the reports of the U. S. Dept. of Labor. I have tabulations and have made com-
1659 putations relative to the proportions of copper and lead in typical sizes of cable; in sizes ranging from 51 pairs to 909 pairs. They are 22-gauge cable; that means that the wires of the cable have a certain diameter in hundredths of an inch, corresponding to what is called a 22-gauge. I have not in mind the figures for the diameter.

The source of my information is the Graybar Company catalog. The Graybar Company until recently was practically a department of the Western Electric Company. It was owned by the Western Electric Company but was recently sold to the employees of the Company. I have a printed sheet with two tables thereon marked City Exhibit 106 for identi-
1660 fication. I have made further computations to show the disparity of figures between cable of different sizes.

(City Exhibit 107 marked for identification.)

This table (City Exhibit 107) was made up from the copper and lead prices as shown in City Exhibit 102 and from the weights of copper and lead used in each of the different sizes of cable.

1661 From those, the data of price per pound and the number of pounds per foot of cable of copper and lead, I

computed the cost of copper and the cost of lead per foot for each of the sizes of cable.

These figures in City's Exhibit 107, appear in the fourth column for copper, the fifth column for lead in the 51 pair cable. The sixth column is the sum of the copper cost and the lead cost.

Now, for example, the top line is the year 1923. We find that copper was at 14½ cents a pound, and lead about 7.4 cents a pound.

In the 51 pair cable the cost of the copper per foot of cable was .0287 as shown in the fourth column, and of lead, .0528, as shown in the fifth column; and of the two metals together, .0815, as shown in the sixth column.

In the sixth column, below the cost of copper and lead together, per foot of cable for the 51 pair cable, in the year 1923 we find comparable costs in 1922, 1921, and so on down to 1911.

Going down the column and in the lower part of the 1662 table, we have computed the relative cost of metals in this size of cable for the years 1911 to 1923, taking 1923 as the base at 100 per cent.

To illustrate the method we divide .0679 by .0815 and we get 83%—.0679 the price of metals in 1922 being 83% of the price of the same metals for the same cable in 1923, and so on down the column.

These percentages were computed for each year.

Confining our attention to the lower part of the table for this 51 pair cable, we find that in 1921 the metal prices were 71 per cent of those of 1923. In 1920 they were 115 per cent, and so on.

Now, this method of computation was followed for each of the different sizes of cable, the 51 pair, the 100 pair, and so on, up to the 909 pair.

In the bottom of the table, are shown these percentages or cost indices for each of the seven sizes of cable shown.

Mr. Bangs: Just a minute; I move to strike out all of the

testimony of the witness relative to Exhibits 106 and 107, and I object to the question just asked.

1663 (Motion denied.)

I draw a conclusion from this table—First, if I may refer to City's Exhibit 106 and to the index numbers in the upper table of this exhibit where the relative change in 1664 the prices of copper and lead are shown, these index figures are in the last two columns of the upper table of the exhibit, and are stated in terms of the prices of 1923 for each of the metals.

From an examination of those figures, it is seen that the relative change in the price of copper was quite different from the change in lead.

The proportion by weight of copper and lead for a given size of cable remains constant through the years though the prices of the metals change in a different way.

The price of copper for example, in 1917 was more than twice as much as in 1923, whereas the lead was 1.23 times as much.

Now, referring to City's Exhibit 107, we show in the lower part of the table the cost indices for each one of the sizes 1665 of cable where we have combined the cost effect or price effect of the copper and lead as the prices have changed through the years.

We find from an examination of these percentages or the cost index in the lower part of the table Exhibit 107, that there is, as a result of the change in the metal prices a much greater disparity between the prices of large sized cable and the small size cable than there is between the prices of cables more nearly of the same size.

For example, the 606 pair cable and the 909 pair cable as shown in the last two columns have the same cost indices in 1911,—76 per cent of the cost at 1923 price levels.

These two sizes of cable are more nearly of the same size than are the 909 pair cable and the 51 pair cable as shown

respectively in the last column and in the first column of indices.

We find in making this comparison that whereas the metal prices for 909 pair cable in 1911 were 76 per cent of the prices in 1923, the metal prices of the 51 pair cable were 70 per cent of the prices in 1923.

1666 There is a greater dispersion of prices of the metals in the cable due to change in metal prices as between the large size and the small size cable, than there is between two of the larger size cables. The metal prices are a large factor in the cost of cables; they, however, do not include all of the costs.

They take no account of labor and the cost of manufacture. They, however, do represent a large percentage, and a very large percentage of the cable cost.

In my opinion they are fairly typical of the spread or dispersion of costs of the cable in place.

Turning to Mr. Sloan's book, Plaintiff's Exhibit 1, page 1, and referring to the item "Omissions and Contingencies $551,264," the last item in direct cost of the reproduction estimate, I should say that that item is not properly included in

1667 the reproduction cost as of 1923, for the reason that between 1911 and 1923, the Company retired approximately $27,000,000 of property, which was $5,000,000 more than the Company actually had in 1911, as shown by the Byllesby and Arnold appraisal, and the omissions and contingencies would have gone out or have been retired along with the property itself.

Now, Mr. Sloan's estimate of book costs includes all of the property. There is no omission proper to be included because the books reflect all of the property.

This item of $551,264 is the same item that appears in the Byllesby and Arnold appraisal.

It is proper in a reproduction new set-up to provide for omission and contingencies, but not in this case for the reason, as I have stated, that this property on the average has more

than all gone out of existence and it was this property of
1911 that was assumed to have been omitted from the
1668 Byllesby and Arnold inventory.

When I came with the Chicago Telephone Company in 1893, the subscribers' lines were almost all grounded magneto lines. That means that the subscriber has a single wire
from his telephone to the Central Office, and the circuit
1669 to complete the flow of electrical impulses and make possible conversation, is completed through the ground. We can think of it as being from the subscriber's line to the Central Office over the wire, and back to the subscriber through the ground, the ground being a common return; the subscriber's telephone was a magneto telephone with a Blake transmitter.

The grounded line service, which was furnished exclusively in Chicago just prior to the introduction of the Long Distance service consisted of a single wire from the subscriber's telephone to the Central Office.

The metallic service, metallic line, consisted of two wires between the subscriber's instrument and the Central Office,
the second wire taking the place of the ground return
1670 necessary with the grounded line or single wire. This with the long distance transmitter was introduced and supplied to those subscribers who had a considerable use of the Long Distance service.

It was found that when the grounded subscriber's line was connected to the Long Distance line that there was noise and difficulty in carrying on a conversation, and that such difficulty was largely eliminated or obviated through the use of metallic lines instead of grounded lines. I don't know the number, but in 1893 there were quite a good many metallic lines with Long Distance transmitters for the subscribers who had use of the Long Distance telephone service.

The New York-Chicago line was completed late in 1891 and grounded line subscribers who attempted to use that line had considerable difficulty due to the induction.

Those who had sufficient use of the Long Distance were provided with the metallic line and the Long Distance transmitter, but were asked to pay a higher rate of rental
1671 than had been paid for the grounded line telephone.

The metallic line, having two wires, cost more than the grounded line, which used only one wire.

The Long Distance transmitter and its telephone were owned by the American Telephone Company, and I am unable to state what the cost may have been.

In those days the charge for a grounded line business telephone was $125 a year; for lines equipped with metallic circuits and long distance transmitters the charge was $175 a year.

Prior to 1911, the A. T. & T. Co. owned and operated its own long distance board in Chicago. It was located at approximately where the Stock Exchange Building is now located on La Salle street. That is where the long distance toll lines terminated.

1672 There were long distance trunk lines connecting the A. T. & T. Company's long distance board with the Central Offices of the Chicago Telephone Company. In 1911 the Company installed a new toll board to take the place of the A. T. & T. Company's long distance board and the Chicago Company's local toll boards, both of which were retired; the toll board to be used jointly for long distance and for the Chicago Company's local tolls. This toll board was in use in 1923. With the installation of that toll board, it was possible to make common use of the trunk lines to the local central offices. One of the features of that toll board was its joint use for long distance and for local tolls and the joint use of trunk lines from the toll board to the local central offices for long
1673 distance and local tolls. The long distance board and the long distance trunks from the long distance board to local central office were then no longer necessary. A payment as rental was made by the A. T. & T. Company to the Chicago

Company for the use of long distance trunks prior to 1911.

1674 I am familiar with the facilities of the Illinois Bell Telephone Company required to establish the connection between the exchange stations and the toll switchboard in which the trunk lines of the long distance service terminate, or between the exchange stations and the toll trunks, when such trunks are employed to effect connection with the toll switchboard, for the purpose of personal communication or transmitting messages between subscribers' stations in the

1675 City of Chicago and some points outside of the City of Chicago, over the long distance lines. Those facilities include the six hundred fifty odd thousand subscribers' instruments, the subscribers' installations of inside wiring connecting the subscriber's telephones with the outside lines, the subscriber's drop wires, the private branch exchanges, interior block wires, booths and special fittings, the subscriber's lines, including the line wires, the aerial cables and terminals, the poles, the underground cables, and underground conduits and the central offices and central office buildings and the land on which they stand. It includes also the exchange right-of-way.

By long distance I mean the lines of the Illinois Bell used in connection with the lines of the A. T. & T. Co. for messages between points in Chicago and points outside of the City of Chicago and Illinois.

1676 Referring to Plaintiff's Exhibit 1, at page 1, Mr. Sloan's final summary as of June 30, 1923, of the cost of reproduction of the Chicago Division of the Illinois Bell Telephone Co., I have checked over that page to determine which classes of plant and which items constitute the facilities of the Illinois Bell necessary to make the connections above referred to. They are all of the items except the toll accounts, which are numbered 251, 252, 253, 254 and 255. The aggregate in dollars of the items, save those which I have just excepted, will, on Mr. Sloan's basis, be approximately $142,000,000.

The classes of property used jointly in making the connections for long distance service and in local exchange and local toll service, are all of the classes of property on page 1 of this exhibit, except the toll accounts which I have excepted, and excepting those parts of exchange underground conduit, exchange underground cable, Central office equipment, central office building and land, which are properly allocable to exchange service exclusively.

1677 It is my offhand opinion, and this estimate is a rough one, that two-thirds of the central office telephone equipment, other equipment of central office, buildings and land, are allocable to the joint local exchange, long distance and local toll services, also about one-half of the exchange underground conduit and of the exchange underground cable. Those exceptions, the one-half of exchange underground cable and of exchange underground conduit and the one-third of the central office telephone equipment, other equipment of central office, buildings and land, are allocable to the exclusively local exchange service.

Based upon those considerations, and that opinion, I would say that at least 60% of the $145,248,344, being the total of the items listed on page 1 of Plaintiff's Exhibit 1, are used jointly for long distance connections, local exchange and local toll service.

1678 At least 60% of the total property listed on City Exhibit 4, Illinois Bell Telephone Co., Chicago Exchange Plant and Equipment, Jan. 1, 1923, $91,707,250.97; as of June 30, 1923, $95,820,390.39; and as of Dec. 31, 1923, $100,957,961.66, I would say is used by the Illinois Bell Telephone Co. jointly for the purpose of making connections for long distance service and in the local exchange and local toll service.

The certain items of expense that Mr. Sloan enumerated as items to be taken into account in determining the going value of the Chicago Division of the Illinois Bell Telephone property, enter into the attaching of the business and the operation of the plant which I have said is necessary for the joint use in connecting for long distance purposes and in local ex-

change and in local toll service, and each would be involved in Mr. Sloan's estimate of going value.

1679 The items going to make up Mr. Sloan's going value are all factors in the property allocable to the joint local service, long distance service and local toll service, and in my opinion at least 60% of these items constituting going value, are allocable to such joint service.

The terminal loops referred to in City Exhibit 24, Contract of July 1, 1891, between the A. T. & T. Co. and the Chicago Telephone Co. were subscribers' lines, so-called.

1680 They were required by the A. T. & T. Co. for its long distance service. They were metallic circuits connecting telephones, telephone instruments, located as requested by the A. T. & T. Co., and connected to the Chicago Company's central offices. Their purpose was to connect long distance service, recognizing that a first class long distance service was not practicable from the ordinary grounded line subscriber's circuit.

The words "Public Pay Stations" used in that contract mean just what they mean today.

Operators and maintenance enter into the use of property of the local exchange in connection with long distance business in this way: The property devoted to or used in long distance service, local toll service and local exchange service is maintained by the company's regular maintenance forces, and a portion of the maintenance costs for each class of property is properly allocable to the joint services referred to, in proportion to the plant devoted to those services.

The company's office forces are engaged in giving the

1681 three kinds of service. I speak now of the present time.

In 1923 they were engaged in giving the three classes of service, and for years before that time, in fact, since long distance service and the toll service were first started.

The central office operator, who answers the subscriber and serves him on either local exchange, local toll or long distance, is devoting her time to those classes of service, respectively,

and a portion of her salary should be chargeable to long distance, to local toll and to local exchange.

The same principle applies to supervisors and to other traffic employes. Certain operators devote their time exclusively to local service, certain others exclusively to local toll, and certain others exclusively to long distance.

I am speaking of the 1923 conditions.

In years past I have had traffic data showing the number of originating peg count calls on the local service, on the local toll service and on the long distance service, the number
1682 of completed messages of each class, and the number of incoming messages of each class. Those data have been kept in the company's records for years, and I have known of them and have studied them.

When you speak about use, to me, it means more than the number of calls originated, for the use of the facilities on a long distance call or message is greater than for a local message. The amount of usage measured by the amount of time in use varies with each of the three classes of service.

Now, data to show such usage is to be had in the company's records, from what we call their service observations, and I have had such data in years past.

I am unable to give a reasonably accurate answer as to the proportionate use of these facilities. We have made such studies for Syracuse, New York; Buffalo, New York; and New York City. I don't remember accurately for what period of time the study was made, but it involved the data of a
1683 number of months during the course of the year.

I am familiar with Mr. Cleveland's testimony on working capital to the general effect that the necessary cash working capital of the company in the City of Chicago on June 30, 1923, was $3,000,000, and that on that date the materials and supplies amounted to approximately $250,000. It is my opinion or judgment that, assuming for the moment that $3,000,000 is the proper amount, that 60% thereof is properly allocable to the property used jointly for making connections between

telephone stations in Chicago and the toll trunks connecting the local central offices with the toll boards, and the Chicago Company's lines connected to the long distance lines of the A. T. & T. Co. at the city limits of Chicago for long distance messages, local exchange service and local toll service.

1684 My judgment with respect to the item of materials and supplies, assuming the amount to be $250,000, is that at least 60% is properly allocable to the property used jointly in furnishing long distance, local toll and local exchange service.

I have examined the stipulation entered into in this case in regard to Mr. Renwick's testimony as to the value of the buildings of the Chicago Company in Chicago. Mr. Renwick claimed that he used the Sinking Fund method in estimating depreciation in each of those buildings.

1689 (It was stipulated, so far as plaintiff is concerned, that Mr. Renwick's testimony and the stipulation in regard to his testimony as to the value of the buildings of the plaintiff in the City of Chicago, used and useful, had to do only with the reproduction cost new of those buildings without his attempting to measure the depreciation therein by any method.)

During the time I was Chief Engineer of the Chicago Telephone Company, from about 1901 to 1916, I received a great many circular letters from the A. T. & T. Co. A great
1690 many of the bulletins and circulars came down the line —that is, handed down to me, as Chief Engineer, but a
1691 great deal of data of that character came direct. I received instructions other than by bulletins—that is, by letters and through conferences with the A. T. & T. Co. engineers and other officers. Some of the bulletins came to the company addressed either to the President or Vice-President and were then transmitted to the Chief Engineer; others came directly to the Chief Engineer. These communications were in the nature of bulletins, specifications, circular letters,

studies and other letters. Specifications would deal with the detailed method of building a pole line, or laying con-
1692 duit, or building a manhole. Instructions, perhaps, is a rather strong term to apply to all of the communications, for the reason that most of them were stated in such language as to indicate that they were offered for the use of the local company.

1694 One instance of a conference with respect to the affairs of the Chicago Telephone Company which I recall was in regard to the adoption of what was characterized as an all-cable distribution plant. When the City of Gary was just growing up it had a heterogeneous and badly arranged telephone plant, that was inadequate for the purpose. This was unavoidable because of the way the City of Gary grew up. Plans were made for an all cable distribution, with twisted pair drop wires from the cable terminals to the subscribers' premises. That plan was prepared and was objected to by the Chicago management as not complying with the standards in use prior to that time.

1695 The conference in regard to plant at which the management objected to the plans, was held in Chicago, at the General Manager's office, and there were present Mr.
1696 A. S. Hibbard and myself. That conference was followed by another conference with officers of the A. T. & T. Co. held in New York. There was present Mr. A. S. Hibbard, Mr. Allard Smith, Mr. J. Russell Jones, Mr. F. L. Rhodes of the A. T. & T. Co., and some of his assistants. I don't recall any others specifically. It was along in 1901, 1902 or 1903. I wouldn't be sure of the date. I was present.

Mr. Hibbard was General Manager of the Chicago Telephone Co. Mr. Allard Smith was one of my assistants who had charge of the plans for outside plant construction in the Chicago property. Mr. Jones was Mr. Smith's assistant. Mr Rhodes was outside plant engineer for the A. T. &
1697 T. Co.

There were a series of conferences running through a period of two or three weeks. Some of them in a hotel on

34th street. We had a suite of rooms there. Some were in Mr. Rhodes' office in the Telephone Building in New York. The same people were not present at all of the conferences,—sometimes two people; sometimes three people; sometimes all of them. Mr. Rhodes or one of his assistants was always present, I think. The general subject matter of the conference involved the type of construction and the engineering plan best suited to conditions like Gary, Indiana. It was a
controversy between the advocates of the all cable plan
1698 and the advocates of the open wire construction,
such as had before that time been in use in Chicago. It involved many other things in the all cable plan; the placing of the sub-station protectors within the subscribers' premises, whereas, on the open wire plan, the fuses were placed just outside of the subscribers' premises, on the wall of the house or building. It involved the use of twisted pair drop wires to the subscribers' premises from the aerial cable terminal for the all cable plan. The open wire construction involved the use of drop wires consisting of one waterproof covered wire and one bare wire from the fuses at the subscribers' premises to the cross arm on the pole, where they connected with the line wires.

Mr. Hibbard, the general manager of the Chicago Telephone Company, favored the open wire construction with the outside fuses. Mr. Rhodes and his assistants favored the all cable plan with the twisted pair drop wires and the inside protector. The latter plan was followed.

During the time that I was connected with the Chicago
1699 Telephone Company, various data were called for from
time to time by the A. T. & T. Co. There was a monthly report of the company's operations in great detail. Those reports showed the operating revenues by certain subdivisions. For example, exchange revenues and toll revenues, and then subscriber's revenue was subdivided into subscribers' rental and pay station. Toll revenue was divided into message tolls and other toll revenue. The operating expenses were divided up between maintenance, traffic, commercial and general ex-

penses, and the maintenance expense further divided between supervision, current repairs, station removals and changes. Both the traffic and general and commercial expenses were subdivided; the number of stations in service reported; and other data in regard to miscellaneous earnings, miscellaneous non-operating earnings and miscellaneous expenses; rent and so on.

The A. T. & T. Co. analyzed these monthly reports and submitted comparative statements to show how the results of operation of one company compared with that of another company, and those statements came to my attention. One of the purposes of the specifications, bulletins, general engineering circulars, was to bring about uniformity and standardization of equipment, outside plant, methods, and so forth. Prior to 1900, or thereabouts, the Chicago Company did a great deal of experimental work; a great deal of inventing was done.

1701 The instructions, suggestions or advice, or whatever the character of these communications might be denominated, were almost universally followed.

1702 I made three or four inventions while in the employ of the Chicago Telephone Company. Patents were applied for. Under a contract which I had with the Chicago Telephone Company they were assigned to it and later to the A. T. & T. Co. I received $50 per invention. Other employes had such contracts, Mr. S. J. Larned, Angus S. Hibbard. J. J. O'Connell—perhaps others. The regular rate was $50.

1702 Shortly after the assignment of my inventions to the Chicago Company, which I think was about 1900 or 1901, I was called to the Congress Hotel by Mr. Frederick P. Fish, President of the A. T. & T. Co., at that time. He discussed with me the application for a patent and complained that I and two of my assistants had joined in each application. He thought there should be one application and one payment of

$50 per patent. It was a case where we thought we were joint inventors.

1704 City Exhibit 98, marked "Comparison of Labor Hour Performance under Specific and Routine Estimates, New York Telephone Company, New Jersey Division, Exchange Aerial Cable, being specific and routine estimates," admitted in evidence.

(Objection by plaintiff. Objection overruled.)

City Exhibit 99, which is headed "Comparison of Labor Hour Performance under Specific and Routine Estimates, New York Telephone Company, New Jersey Division, Exchange Aerial Cable," being specific estimates. admitted in evidence.

(Objection by plaintiff. Objection overruled.)

City Exhibit 100, "Comparison of Labor Hour Per-
1705 formance under Specific and Routine Estimates, New York Telephone Company, New Jersey Division, Exchange Aerial Cable," being routine estimates, admitted in evidence.

(Objection by plaintiff. Objection overruled.)

City Exhibit 101, "Comparison of Labor Hour Performance under Specific and Routine Estimates, New York Telephone Company, New Jersey Division, Exchange Underground Cable," being specific and routine estimates, admitted in evidence.

(Objection by plaintiff. Objection overruled.)

City Exhibit 102, same heading except it concludes—"Exchange Underground Cable," being specific estimates, admitted in evidence.

(Objection by plaintiff. Objection overruled.)

City Exhibit 103, with same heading except it concludes—"Exchange Underground Cable," being routine estimates, admitted in evidence.

(Objection by plaintiff. Objection overruled.)

City Exhibit 104, "Comparative Price Levels, 1923, 1924 and 1925" admitted in evidence.

1706 City Exhibit 105, showing relative amount of book costs of each class of plant, inspected by S. A. Rhodes in 1921 and 1923, admitted in evidence.

Objection by plaintiff. Objection sustained.)

City Exhibit 106, two tables marked metal indexes on 1923 base, and weights and proportion of base metals, admitted in evidence.

(Objection by plaintiff. Objection overruled.)

City Exhibit 107, entitled "Base Metal Prices, and Composite Metal Prices of typical sizes of 22 gauge (B. S. A.) cable," admitted in evidence. overruled

Objection by plaintiff. Objection ~~sustained.~~)

1708 *Cross-Examination of Mr. J. G. Wray by Mr. Bangs.*

In my testimony regarding the use of property for the rendering of what we call local service and toll ser-
1709 vice, I intended to include all three services,—the long distance, the local toll and the local exchange.

That was true as to all of my statements regarding what we understand as separation of property. In using the words "local exchange service", I had in mind what is known as the station-to-station theory of the separation of property.

My contention is that the property used jointly for the three classes of service—the long distance, the Chicago
1710 Company's local toll and the local exchange service should be apportioned in respect to its annual charges between those three classes of service according as it is used.

Irrespective of a station-to-station theory, there is a joint use for all three classes of service of the subscribers's telephone and line, including the station installation, the poles, the wires, the cable, the conduit, the Central Office equipment, private branch exchanges, booths and special fittings. In determining the exchange rate I would apportion to exchange

all of the property which was not used for long distance
1711 or local toll, or allocable to those services. I would allocate the property to toll service on the basis of the amount of use of the subscribers' station equipment; also the remainder of the equipment from the subscriber's station up to the property that was exclusively toll. That was the contention of myself and my associates in the Syracuse case and in the Rhode Island case, and in the New York City case before the Public Commission and the one just prior to the Federal case yet undecided.

In the New York case there was a differentiation
1712 claimed by the company between what we call long distance service and what we call local toll service, as to the allocation of property. The company allocated the property used in its local service on the station-to-station basis and the property used in long distance on the board to board theory, because, as the company's witnesses claimed, the first basis was according to the fact and the second basis was according to a contract. The first basis was according to the use of the property; the toll rates for local toll service were measured from station to station.

1713 Plaintiff's Exhibit 42, being first page of pamphlet headed "Chicago Telephone Company, Chicago Division, Plant Accounts Classified on basis of Byllesby-Arnold appraisal of July 31, 1911", marked for identification.

I did not testify to any re-classification as a result of the Byllesby-Arnold appraisal. I testified to a figure in the Byllesby-Arnold appraisal for exchange aerial wire and the corresponding figure found on the company's books.

1714 Plaintiff's Exhibit 42 is the basis of my testimony in that regard.

1715 (Witness reads from Byllesby-Arnold appraisal, Plaintiff's Exhibit 42, showing account on the books and corresponding accounts in the Byllesby-Arnold appraisal.)

Right of way of exchange on the books	$ 17,627
Byllesby-Arnold appraisal	58,782
Total Central Office Equipment, books	4,651,895
Appraisal	4,517,030
Total station equipment, including station apparatus, station installations, interior block wires, private branch exchanges, booths, and special fittings, all of which on the books were included in one total, were on the books	6,115,389
And in the appraisal	5,290,773
Exchange pole lines, books	1,146,321
Appraisal	1,437,817
Exchange aerial cable, books	1,116,776
Appraisal	1,135,192
Exchange aerial wire, books	1,673,758
Appraisal	940,795

That was a decrease, and the station equipment was
1716 a decrease, and the Central Office Equipment was a decrease; there has been only one increase so far—two increases so far in my reading.

(Witness continues reading.)

Exchange underground conduit, books	$3,532,936
Appraisal	4,210,886
Exchange underground cable, books	4,900,950
Appraisal	5,732,625
Exchange, submarine cable, books	993
Appraisal	
Toll poll lines, books	1,663
Appraisal	87,493
Toll aerial cable, books	22,651
Appraisal	15,503
Toll aerial wire, books	32,123
Appraisal	143,225

The combined figures for exchange aerial wire (substantially decreased) and toll aerial wire (substantially in-

creased) were on the books $1,705,881—appraisal $1,084,020.

Toll underground conduit, books $321,124—appraisal
1717 $235,117. Toll underground cable, books $383,990—appraisal $365,519.

The total book cost, exclusive of land and buildings is $23,918,196 and the corresponding figure in the appraisal is $24,170,757. I think some of the difference between the books and the appraisal might have resulted from the classification between exchange and toll. The appraisal covered the company's property as of July 31, 1911 and the company's books show the cost of the property from its inception in 1881 down to 1911, built at the lower price level of those dates. In my direct testimony I did not intimate or suggest that there was any deliberate attempt or desire on the part of the com-
1718 pany's engineers to fail to follow their directions in regard to the reporting of all retirements. I think it is just the human error equation, including also a not very exact interpretation of the accounting rules. The accounting rules as to reporting of retirements are that they shall be recorded at the original cost if that is known and if not, at the estimated original cost.

Referring to my Exhibit 104 and my testimony as to the reduction in comparative price levels from 1923 to 1924, my data is compiled from the following sources:

1. Material and metal products, general indices of the U. S. Department of Labor;

2. Building materials—General Indices of the United States Department of Labor;

3. Pay roll totals, manufacturing, general indices, U. S. Department of Labor.

I don't recall how many industries are included in the payroll totals. In the payroll indices there are included 54 industries, 12,138 establishments and the payrolls are the total earnings of the employes, including overtime.

1720 Referring to Exhibit 104, Item 4 N. C. poles F. O. B. Gemmill, I think the prices are according to the specifications of the Northern Cedar Men's Association. They are

not A. T. & T. specification poles. They do not include freight. The next item 5—wire—was No. 8 B. & S.;
1721 that is not used in the City of Chicago unless a little of it on the New York line that came into the city. The next item, galvanized iron wire, I doubt whether any is used in Chicago. The next item, Composite of No. 92 jack switchboards and Composite of No. 49 jack switchboards are at Western Electric prices. They represent material only and not the cost of installation.

1722 I have not enumerated all of the data upon which I base my opinion as to the trend of prices from 1922 to 1925. Our files are full of data on other items. Mr. Turner got everything that he asked for. I have other things in mind than those set forth in the items just testified to. I will give them to Mr. Turner. I used the general index of the U. S. Department of Labor for metal and metal products as a basis for my judgment as to the trend of prices for the construction of telephone property, because the base price of metals is an indication of the trend of prices. The trend of metal prices by itself would be a dangerous thing to use in determining telephone construction costs.

1723 I included it in City Exhibit 104 because it is one of a number of items indicative of the general trend of prices. It would be dangerous to use as an exact measure of the change in prices of telephone construction. I have criticized witnesses for the use of such data as a measure of telephone construction costs. I have criticized the use of such data in arriving at a conversion factor to be used in estimating construction costs.

The earnings of employees engaged in 56 miscellaneous industries,—12,138 establishments, has no direct bearing on the labor prices enering into the construction of telephone
1724 property. It is simply indicative of the general trend. The general trend of commodity prices in general and labor prices in general have no direct bearing on cost of telephone construction. It is only indicative of the general trend of prices which would indicate telephone prices; but as a meas-

ure of the change in telephone prices, it is of no value. I don't recall that I ever criticized the use of such data to indicate the trend of prices but I certainly have as to their use as a measure of the change in prices.

1725 A consideration of items which are not used in the construction of the plant of the Illinois Bell Telephone Co., 1923 to 1925, would be of little value except as indicating the general trend of prices.

The trend downward in the case of poles (shown in City Exhibit 104) indicates to me that the cost of poles in place will be downward. To me they are fairly representative of the change in prices of poles. I could not answer why I did not take the poles used by the Illinois Bell. The change in prices of No. 92 jack switchboards is indicative of the reduction or lowering of the price of that equipment in place. That equip-

1726 ment is used extensively in Chicago. The lower price would result in lower cost in place, unless there was a compensating increase in labor cost. An increase in labor cost is a possibility.

In my direct testimony I said that I never before heard of Mr. Sloan's method of appraisal. I have been in court most of the time during the taking of testimony offered by the plaintiff in this case. I don't recall that I heard Mr. Turner testify that the method of appraisal used by Mr. Sloan

1727 was also used by Mr. Turner and Mr. Sloan before the Illinois Commerce Commission in the case here under review and that the same method was used by the company's engineers in the case before the Public Utilities Commission of Illinois which was decided Dec. 20, 1920.

1728 I am not familiar with the final order of the Public Utilities Commission of the State of Illinois (Dec. 20, 1920) on page 9 of the Exhibit in that case, only as I have heard you read it. I testified that, in my judgment, Mr. Sloan was incorrect in including $551,264 for omissions and contingencies. I said that he was incorrect because he was

1729 including omissions and contingencies on plants some or all of which had been displaced since the date of the

appraisal. Assuming that the per cent used in the Byllesby and Arnold appraisal for omissions and contingencies was 3% and assuming that Mr. Sloan computed that 3% upon the basis of the residue of the Byllesby & Arnold appraisal, after deducting therefrom all displacements from 1911 to the date of his appraisal, I would withdraw my criticism if those displacements had been made to include overhead costs. That would take account of this allowance for omissions and contingencies. I would withdraw my criticism if the displacements were all taken account of.

1731 (Mr. Bangs states he has report from Mr. Turner as to result of his examination of data and information given him in support of Mr. Wray's testimony that the prices of telephone construction declined from 1923 to 1925 and reads from Turner's report of such examination to ask witness whether information therein is correct.)

1732 Mr. Cummings worked up most of the information for me in regard to my testimony that the prices of telephone construction declined from 1923 to 1925 but he did not prepare my opinion. In addition to the Exhibit, I considered the following indices from the Department of Labor:

1913 equals 100—For 1923, Material 189; labor 207 Composite 199;

1924—Material 175, labor 224, Composite 201.

1925—Material 175, labor 233, Composite 206. This shows that the composite of material and labor increased from 1923 to 1925 from 199 to 206. This information was taken from the Department of Labor of the United States shown by the monthly labor review.

1733 We considered the indices of the U. S. Department of Commerce for buildings as taken from the engineering news record—cost index 1913 equals 100; then follows a table of which the titles across the page are as follows:

	Brick with Wood Frame	Brick with Steel Frame	Reinforced Concrete	All Types
1923	219	212	210	214
1924	218	210	206	215
1925	210	202	200	207

It is not correct that in preparation of the exhibit that we had no information other than as to Central Office Telephone Equipment. Mr. Cummings had in his note book a cost index which he computed from a study made in 1924 by one of our men at the time that the Western Electric Company made a substantial reduction in the price of the 92 jack and the 49 jack Central Office Equipment; that was July 1, 1924.

1734 The final computation is shown in the Exhibit. We had no other data on other equipment of Central Office. It is not correct that the curve as to station appartus was based on independent manufacturing company prices. We had Western Electric prices for some jobs of station apparatus.

1735 Referring to Mr. Turner's report as to apparatus prices which were determined in connection with the New York case, there is a table headed "Western Electric Prices" showing the following:

There are four columns 534-A Signal case, 40 A. L. Desk stand, 450 Desk Stand cord and the desk stand complete with signal case and cord. For 1923, column 1 is 3.95; column 2, 2.60; column 3, .99; column 4, 7.54.

1736 1924—Column 1 3.95
Column 2 2.61
Column 3 .99
Column 4 7.55
1925—Column 1 4.01
Column 2 2.75
Column 3 1.05
Column 4 7.81

The foregoing is additional data referred to on Western Electric prices. On station installations, interior block wires,

there was no data. There was no data on private branch exchanges, but the equipment going into the private branch exchanges is the same equipment that goes into the Central Office switchboard and will have the same general trend of prices. My statement relative to private branch exchanges is founded on my statement relative to Central Office equipment but the figures given for Central Office
equipment are nothing more than an indication of
1737 the trend of prices; that was the basis of my statement.

There was no data on booths and special fittings. Cross arms, no data. Anchors, guys and pole line hardware based on price of steel billets as shown by U. S. Department
of Labor upon actual sale price per ton, in one column
1738 and a cost index in the next column. Columns 2 is the cost index price on the basis that 1913 equals 100

1923—Column 1, $41.65; Column 2, 161.5
1924—Column 1, $38.00; Column 2, 147.3
1925—Column 1, $35.45; Column 2, 137.5

1739 My opinion in regard to the whole situation is based upon my general knowledge in addition to these specific facts that we have brought to your attention. I would not say that everything that I had available in my office bearing upon my conclusion was brought to Mr. Turner's attention.

1740 He was told all of the items that specifically were considered by Mr. Cummings in connection with this Exhibit, but you must remember that I have been considering prices for years and we have books full of prices and price data with hundreds and perhaps thousands of items. My testimony now refers not only to the exhibit, but to my opinion, that the trend of prices of construction, labor and material entering into the plant of this company for the years 1923 to 1925 was slightly downward. The next item in my data as to aerial cable consisted of prices reported by U. S. Department of Labor; the first column—copper per pound, and the second column lead per pound

1923—First Column $.145 Second Column .074
1741 1924—" " .131 " " .083
1925— " " .141 " " .091

I did not make any composite. We use no cable prices in this computation. We have a lot of cable prices that affected my conclusion in regard to the prices. Terminals were not considered. The hardware is the same as the steel billets referred to.

1742 As to aerial wire in a broad sense we have the exhibit only. We obtained prices from the Department of Labor and those prices were reduced to the cost index basis; for example, the price of copper wire as computed by the U. S. Department of Labor in 1923 was .175. I think that was size 8. The price per pound for the different sizes of wire differs only by the amount of drawing cost, but the trend of the price for one size of wire will be the same as for all sizes. The only data used for that Exhibit as to wire was the U. S. Department of Labor—copper wire, galvanized. Most of the wire used in Chicago is aerial drop wire, that is, covered wire.

1743 I don't have specifically in mind that the price of that character of wire rose from $12.17 per thousand feet to $13.05 per thousand feet in 1924 and in 1925 was $12.40. There was no study of the completed conduit. There was a study of the price of brick and the price of cement; data in regard to those two were given to Mr. Turner. My conclusion was based on certain specific information that Mr. Cummings brought to me. I don't remember having seen the brick and cement prices at the time but my conclusion is also based upon my general knowledge of the price conditions. Underground cable was based on the same data shown for aerial cable except that different proportions of
1744 copper and lead were considered. There were no working papers to support this. The price of copper was going down and in the larger sizes of cable, which are the sizes used in Chicago, the weight of the copper price would be greater than the weight of the lead price. Lead was going up. The

result would be a reduction in price. I have no tables showing that computation. The toll plant is comparable with the exchange plant. No data as to telephone labor cost. Payroll indices shown in the Exhibit were not used to represent telephone labor, but rather as part of the material prices. We did not consider the cost of supply expense or any of the other indirect costs specifically. There was no study of general equipment.

1745 Mr. Cummings' statement to Mr. Turner that the data enumerated was all my working papers used in connection with my conclusion as to the years 1923 to 1925 price is not correct. We have lots of data that we can bring in.

We studied prices in New York and from other data during that particular time and we knew of the reduction and contemplated reductions in Central Office Equipment.

We have other prices and other data in the files and my judgment in regard to prices is based upon all of the experience that I have had. The papers that have been enumerated (given by Mr. Cummings to Mr. Turner) are all of the working papers going to the Exhibit that has been submitted, but they are not all of the papers going to my conclusion.

1748 I have no other specific papers prepared in connection with our preliminary work for answering this question at this time.

I have made no measure and have made no special study as to the composite price of labor and material entering into the construction of the plant of the plaintiff in the City of Chicago to show the amount of the decline. The decline

1749 would probably be less than 10%; it might be 5%; I would not say. I have used cost index curves in other cases.

I remember in a general way the documents heretofore marked for identification during the examination of Mr. Cummings as Plaintiff's Exhibits 31, 32, 33, 34 and 35.

1750 I believe they are the exhibits that were introduced in evidence in connection with my testimony in the statewide investigation of the Indiana Bell Telephone Company

either before the Public Utilities Commission or the Court. Plaintiff's Exhibit 36, which also bears the Exhibit No. A-291, entitled "COMPARISON OF INCREASE SINCE 1914 IN GENERAL COMMODITY PRICES, SELLING PRICES OF TELEPHONE APPARATUS TO ASSOCIATED COMPANIES AND TELEPHONE CONSTRUCTION COSTS" is known as the Halsted Exhibit in the Indiana proceeding.

1751 In that proceeding I was asked the following question and made the following answer thereto:

"Q. I hand you now, Mr. Wray, an Exhibit A-291, which was prepared by Mr. B. G. Halstead, Appraisal Engineer, Indiana Bell Telephone Company, and shows among other things a curve of telephone construction costs of the Indiana Bell. I want you to tell whether this curve of the telephone construction costs of the Indiana Bell is fairly comparable with the curves you have plotted of the telephone construction costs of other telephone companies, with which you are familiar.

A. The curve of telephone construction costs shown in Exhibit A-291, representing the Indiana Bell experience is fairly comparable to the experience as we have found
1752 it with other telephone companies, and as set forth in the tables and graphs that I have just described."

I have criticized Mr. Sloan's method of appraisal in various respects and stated that in my judgment, the method of appraisal which he used would show a greater resulting value, than an appraisal made by an inventory and the pricing out of that inventory at current prices. The allowance that I would customarily make for errors and omissions in an inventory and appraisal, would depend upon the degree of accuracy with which the inventory has been made.

1753 We have allowed 2% and up to as high as 4% I think. That allowance is carried forward into the prices. I could not form an opinion as to the excess which would result from Mr. Sloan's method over the value which would be reached upon an inventory and appraisal because I have not

made such a computation. I have not used the inventory to fix the reproduction cost for the property.

If I were about to undertake the work of estimating the reproduction cost of this property by the inventory method as of 1923 to determine the quantity of labor which would
1754 be required to reproduce the plant, I would make a careful analysis of the company's construction records, discriminating between those jobs that are done in a wholesale way, the large jobs and the work that is done in piecemeal fashion, and consider carefully the costs so determined with costs of similar work in other places, to ascertain whether the efficiency was, perhaps, what it should be, and compare one job against another job and from such analysis I would estimate labor units to be applied to the different units of the inventory.

I base the reproduction cost largely on the company's experience in large work at that time.

1756 (Plaintiff's Exhibit 43 expressing Mr. Sloan's increase in value in a percentage to various book costs, the percentages varying from 32% to 48% depending upon the book cost assumed—Marked for Identification.)

1757 Referring to Plaintiff's Exhibit 43 for identification, it is my opinion that the reproduction cost, 48% in excess of the book cost is too high. I have no way of measuring it. I could not give a figure without making a valuation. In valuations that we have made at about that time of other companies and not particularly important in this comparison, we found as low as 12% excess of reproduction cost over book cost.

1773 I testified in the Indiana case as to the difference between the book cost and the reproduction cost. I don't remember the particular figures. But I am perfectly willing to accept Mr. Bangs' statement of my testimony there. I have no reason to deny that in that case I testified that the percentage of increase was 54.8% or 65.5% depending upon the basis taken for the original cost. If you take the basis of

original cost and the purchase price paid to Central Union, the lower percentage applies. If you take the actual amount shown on the books, the higher percentage will apply.

1774 As to the cost of reproduction I have the following to say: That ratio of the reproduction cost to book cost of any telephone company will depend upon the amount of plant constructed at low prices and at high prices. And these amounts will differ with different companies, for the reason that one company may grow faster than another, for the reason that one company may be able to and may find it necessary to add to its property during a period of high prices when the other companies do not find it so necessary. Now, another factor is the retirements each year at varying retirement prices; another factor is the ratio of labor to materials. In the Bell System, Bell materials cost the same to all Bell companies, but the labor is quite different in one company than it is in another, due to wages, due to the efficiency of employes, due to working conditions, due to organization and supervision. Another factor is the character of the plant represented by the comparisons we are trying to make. The price change for some classes of plant is much greater than for other classes of property and one company may have a lot of buildings, the other company comparatively few, one
1775 company a lot of expensive central office switchboards, the other company comparatively few; one company a few poles, the other a great many; one company no open wire, the other a great deal, and so on. There is no overall comparison that is at all proper.

Now, then, in addition to that we have got to look at the denominator of this ratio. I have been talking so far only of the numerator. Now, the denominator is the book cost, the way the books have been kept, their degree of accuracy, the things that have been charged off from the books, the things that have been charged into the books all have to do with the book cost and this is the ratio of the reproduction cost on the basis for a certain property built during a certain time to the

book cost of that property kept in a certain way; and I say no comparisons of that sort can properly be made.

1776 (Questions by Court.)

I could not express any definite opinion as to the reproduction cost as found by the Illinois Commission in this case without making an inventory and pricing it through. I have no idea on the subject within 5% either way. I would expect the reproduction cost new as of December 31, 1922, was greater than the original cost. I have no conception in mind as to how much greater. I have not made a study of it with that thought in view. I have formulated in my mind what should be done in attaining a reproduction value of this

1777 property. I don't see how anyone can get the reproduction value of this property without making an inventory and pricing it through current prices. There is no way in which I can get an approximate minimum value within 5% either way.

(Questions continued by Mr. Bangs.)

Referring to Plaintiff's Exhibit 44 for identification entitled "Illinois Bell Telephone Company, Chicago Area, Cost Trend of Composite Plant excluding Land and Buildings" and considering also curves that we prepared in that connection in the Indiana Bell case and the curves used in the New York case and considering that I testified before the

1778 Indiana Commission and said "There is a reasonable agreement between the curves from the New York State and Indiana Bell, you could hardly expect them to be just alike because they represent different proportions of different kinds of material."—I could not answer the judge's question.

These are cost indices of the property during a given year based upon the proportions of different kinds of materials and of equipment and of labor, and they take no account whatever of the amount of plant that may have been added or may have been subtracted from the property during any of the years. They are merely cost indices, and assuming them to be

correct, I could not apply them to this case without having further facts.

I want to explain my answer that I could not with the help of the cost indices, give an opinion with reasonable accuracy as to the commission's finding on the reproduction cost of the property. I want to explain my answer.

In order to use the cost indices in arriving at a reproduction cost estimate for a property, you have to get the ratio of reproduction cost to the book cost.

The cost indices are of some assistance in obtaining the numerator to state a ratio or fraction. Before the cost indices could be used correctly, one must know the amount of plant added each year and the amount subtracted. Assuming the cost indices to be correct, and applicable to the property, and assuming we have the data in regard to additions and subtractions from the plant, we have still to inquire into the denominator of the fraction in order to establish the ratio, and that is the book cost. Unless we know that the books are kept in the same way, with the same degree of accuracy and represent the same sort of things in one property as in the other, you cannot determine such ratios with any degree of accuracy.

1781 I don't think I can within 5 or 10 per cent express an opinion as to the correctness of the figure as found by the Commission. The denominator that I referred to is the book cost.

I testified before the Commission and before the Master in the New York case. I am reasonably familiar with the proceedings in that case. They went through a period of 6 or 7 years before both bodies.

1782 The proceedings before the Master lasted 4 or 5 years.

The case referred to is the one in the District Court of the United States, Southern District of New York; New York Telephone Co. *vs.* William A. Prendergast.

The plaintiff in that case offered in evidence a complete inventory.

(Mr. Bangs states he is about to read from the report of the Master. Objection by the City of Chicago that exceptions have been filed to the report that are still pending; objection overruled.)

1783 Mr. Bangs: I am reading from page 18 of the Master's report. "I am of the opinion that the books of the company were sufficient evidence to establish the amount of plant and equipment owned by the company. However, as above stated, plaintiff offered in evidence complete inventories or spot-checks of its entire plant and equipment."

(Witness continues.)

1784 I have doubts as to the correctness of the book cost as representing the original cost of the property in this case. I think it is too high. I don't know how much. I think the difference would be relatively small. I say it is too high even if I have no definite idea how much too high. I know it is further from here to St. Louis than it is to Peoria but I don't know how much.

1785 In the hearing before the Indiana Commission in the case of the Indiana Bell Telephone Company, I presume the following questions were asked me and the following answers given:

"Q. Prior to 1912 from your general knowledge of this property of the Central Union Telephone Company and its operation and from the check which you made at the time of this apportionment, in your opinion did the books of the Central Union Telephone Company accurately and correctly reflect the cost of the property of that Company?

A. It is my opinion that they understated rather than overstated the actual cost of the property."

1786 Then he explained his answer—

"Q. Is what you have said in connection with the books of the Central Union Company likewise true of the Chicago Telephone Company?

A. Yes.

Q. There has been testimony in this case that the

books of that company (I refer now to the Chicago Telephone Company) were audited by Marwick, Mitchell & Company, or some such firm of auditors."

(Objection by counsel for City of Chicago and motion to strike witness' answer on ground there is nothing by way of impeachment in it.)

1787 I would like to make an explanation. I think that testimony related to the property of the Central Union Telephone Company in Illinois, sold to the Chicago Telephone Company. The books of that property and of the Indiana property were kept in the same way, by the same people. Now, the property that we are talking about in this case is the property of the Illinois Bell Telephone Company in the City of Chicago. A reference to the Byllesby and Arnold appraisal will show that the appraisal figures for the property of the Chicago Company in the suburban area, reproduction cost is substantially higher than the books. The 1788 reproduction cost in the City of Chicago was scarcely higher than the books. The books kept in the suburban area showed substantially under the appraisal; those in the Chicago area very little under the appraisal. Now, we are talking about very different things, my testimony in Indiana and my testimony here.

In connection with Mr. Sloan's exhibit, I testified with reference to overheads omitted from the company's books. I think overheads were omitted from the company's books. I have not made any examination that would enable me to say how much. I could not say whether I agree with the Commission's finding that the company's books under- 1789 stated the original cost by $5,000,000. As I understand it, the Commission's finding was that $5,000,000 of overheads had been omitted. My opinion is that retirements of property have not been properly stated on the books, and that fact never can be found from an accounting from that data. Going back to the beginning, I think that more than equalizes the $5,000,000. I would not agree that $5,000,000 of overheads have been omitted from the books. Assuming that $5,000,000

of overheads have been omitted from the books, I think that that would be offset by retirements due to engineers making mistakes, including the time I was Chief Engineer. It is not alone the engineers who make these errors. It is the Plant Department originally. Most of the omissions have been made by Plant Department in their completion reports.

The Chief Engineer is not responsible for the comple-
1790 tion reports. I think he signs them. It indicates that he has been notified and taken note of it, but the Chief Engineer is not supposed to, nor could he, check over such reports in detail to find that all the property removed has been reported. When he approves the report, he assumes some responsibility, but not for those omissions.

It would not make any difference in my answer to the judge's question as to reproduction cost of this property if it was pointed out that the U. S. Supreme Court has taken judicial notice of the increase of prices during the war of not less than 25%, because I was aware of that fact when I made my answer.

I am familiar in a general way with the rate of growth of the property of the Illinois Bell in Chicago. To a limited extent, I have examined Plaintiff's Exhibit 1 containing Mr. Sloan's appraisal and showing net additions by years.
1791 I could not with any degree of accuracy, after examining that appraisal, express an opinion as to the valuation in percentage between the original cost, as shown on the company's books, and the reproduction cost. I doubt whether I could determine it within an accuracy of 5%. Possibly I could within 10%.

I testified as to the percent condition of the Indiana Bell property. I do not remember it except as you stated it this morning, as 89.5%. I believe that the property of the Illinois Bell Telephone Co. in the Chicago Exchange is in good
1792 condition. I don't know so much about the property in Illinois now. I would regard a property that was in 90% condition as being in good condition, with this qualification: A percentage of 90 for a property like that in the City of Chicago will not mean the same thing as 90 per

cent for property like that in Indiana. A pole, for example, under conditions of maintenance in one company in a certain physical condition will be rated as in a different condition when used by another company, for the reason that the standards of maintenance of the two companies are not the same; and for the reason that the load or duty required of the pole is not the same.

Now, the standards of maintenance in Indiana were not the standards in Chicago. The company has not many poles
1793 in Chicago. The variation as between companies will occur in all classes of property, buildings, switchboards, poles, wires, cables. One company will keep its property up to a high degree of service, to a high standard of service, whereas another company in the same system will not keep its property up to the same level.

We made a thorough examination of the Indiana Bell Telephone Co. in Indiana to determine its percent condition. Their standards were below those which I had known in Chicago. I have just illustrated in the case of poles. They have thousands of poles in Chicago. On the average, Chicago would keep its manholes in better condition than Indiana. At that time, Indiana was a poor company. It could not afford to keep its property up in the condition that Chicago was keeping its property.

1794 We are talking now about 1923. When I speak of 90% condition, it is an absolute standard in respect to that company's property, but in respect to another company's property in the same physical condition, we would arrive at a different percent. I will illustrate with an example: In 1911 the central group of telephone companies acquired the Michigan State Telephone Company, which was then operated by the banking house of N. W. Harris & Company.
1795 It made a good net showing when the property was taken over. It was believed that the plant was in poorer physical condition than it would be kept according to Bell standards. An inspection was made and that fact was determined. The plant was not kept up to Bell standards. In

keeping it up to Bell standards, where I was chief engineer of the company, we had to spend more money on the plant and our substantial net earnings disappeared, and the property was operated at a loss.

Now, that fact was discussed by me with Mr. Kingsbury, vice-president of the American Telephone & Telegraph Company, who stated to me that in his opinion the Bell standards could not apply to Michigan; that he would leave the poles stand until they were ready to fall down before replacing them. The Bell standards in general are to inspect the poles and replace them before they are ready to fall down. Now, the percent condition of a pole that is being maintained in a way to be replaced, perhaps four or five years before it falls down, is less for that pole than it would be for the same pole if it were allowed to remain until it would fall down.

The percent condition is the relation of the service life to date to the total service life, including the remaining service life. Rather, it is the remaining service life in terms of
1796 the total service life. A pole that is ten years old and is going to live twenty years would be in 50 per cent condition; but because of the company's standards, if that pole is retired at sixteen years' life, then that pole is in 37½ per cent condition instead of 50 per cent, although physically the poles would be just alike. Per cent condition means the proportion of remaining service life and would depend upon maintenance standards and service of the company.

To determine the per cent condition of telephone property that we are not at all familiar with, we examine the property; we see the load that the pole is carrying; we ascertain sometimes, but not always, the rate of growth and the degree of inadequacy that there may be. But in any event, we take the load that the pole is intended to carry and that is a factor in determining the per cent condition of the pole, because a pole that has a heavy load will have to be retired before the end of its physical life, substantially before it would fall down, before it would rot through. Whereas, a pole with a light

load can be allowed to stand until nearer the end of its life.

1797 The present condition of the pole is a statement of the estimated remaining service life to the total service life. That is the way we determine percent condition in all cases.

I testified in the Ft. Smith case for the Bell Company about seven or eight years ago. I think I determined the per cent condition of the property. I do not remember much
1798 about that case. I would like to add to my answer as to per cent condition of a pole that we include salvage always at 100%. In my testimony in the Ft. Smith case, I said that I did not know the age of the poles except that about one thousand had been placed recently and that I had no idea as to the cumulative age of those. I did not inquire as to the age of the poles.

I could determine the probable future age because where we go into details and make a very minute examination, as I have done in quite a good many cases, we determine the amount of rot at the ground level and we determine the amount of allowable additional rot up to the point where that pole should be removed, where it has no longer the
1799 factor of safety necessary for carrying the load it has to carry. We assume the rot proceeds directly in proportion to time. That is the best information on the subject So if a pole is rotted an inch from the circumference, an inch deep on the pole and can be allowed to rot two inches more before it must come down, then that pole would be in two-thirds condition, and that is without regard to its age or the years of the remaining life.

I do not usually know the average age of the plant when I determine per cent condition. It is not very material. We would usually inquire as to the age of a building but we did not give much weight to that. In the Ft. Smith case I said that the age of the building has not much if anything to do with it. The character of construction and the way it has been maintained would determine the per cent condition. In other words, per cent condition is determined by inspection.

1800 The annual depreciation rate has nothing to do with measuring the probable age of the property. It may have something to do with it. I believe in inspecting a property and ascertaining its condition without any relation to the depreciation rate the age of the property or the amount in the depreciation reserve. I will explain what consideration I gave to the probable future age in determining present condition. The per cent condition is practically the ratio of the remaining service life to the total service life, assuming no change in conditions. I will illustrate that by going back again to the example of the pole. We determine the amount of rot and from a consideration of the
1801 amount of rot and of the point to which the rot may safely be allowed to go when that pole will no longer have the factor of safety for its load—when the pole must be removed because it cannot longer be serviceable. That ratio of remaining rot to total rot, or remaining service life to total service life is per cent condition. But that does not take account of the fact that that pole may be taken down by sleet, or strike, lightning, or an automobile.

It is true of a good many of the properties where I have made a determination of per cent condition that they were properties that I was not familiar with—that I was not operating. I guess those properties mentioned, where I put a corps of men in to go around and inspect the property, were none of them properties that I have operated. I think perhaps in years past I have given a per cent condition to properties I have operated, and I know within the last two years I have done that.

1802 Whether I would make a very thorough inspection to determine the per cent condition of a strange house that I had never seen, would depend upon the purpose. To determine the per cent condition accurately we would make a thorough inspection. If I were going to determine the per cent condition of a house that I had lived in all my life, it would not be necessary to make as thorough an inspection. However, may I qualify that answer? It is directed to Mr.

Rhodes' testimony and it is hardly a fair comparison. The house that I lived in is not added to. The property of the Chicago Company is being added to every year. If the house was being added to while I was living there, I would know just what property was being added.

My criticism of Mr. Sloan's going value was directed
1803 to the result. It was directed to one of the items in his estimate of going value and if that item is too large, his result is somewhat too large. I think the actual number of dollars he arrived at was quite a little above 15%.

I am not quarreling with his judgment that going value of the Chicago property on June 30, 1923, was at least 15%. I have not made an estimate and I will say the 15% may be all right. I do not believe I am justified in making an estimate of going value without making a study of it. In the Indiana case, I had been working on that property for many many months, and while I had made no particular study I was quite familiar with the property. I made an estimate of going
1804 value in the Muncie case. We were on that for months.

In neither case was my judgment of going value based on a detailed study. It was based on judgment formed from quite an intimate knowledge of the properties. I would not want to give an offhand estimate of the Illinois Bell Telephone Company's property in Chicago. I would not want to admit that 10% is the minimum for going value on a property of this size and character. I think that in one case of property of this character I testified to less than 10%. I think that was the New York Telephone Company in Northern New Jersey. That was not within the testimony in cases from which I read, where I said going value had been determined
1805 from 12 to 15%. I haven't any judgment about going value of this property.

(Mr. Bangs offered in evidence exhibits previously marked for identification as Plaintiff's Exhibits 31, 32, 33, 34, 35, 36 and the accompanying charts which will be photostated, being Exhibits identified by Mr. Cummings, and testified to by Mr. Wray as having been introduced by him in the Indiana Bell

case, in connection with his costs of labor and material prices of the Indiana Bell Telephone Company, New York Telephone Company and various other companies.

Offers objected to by the City of Chicago as a whole and each exhibit specifically on the ground that they are immaterial and irrelevant to the inquiry; that on their face they relate to properties that are entirely different; the examination thus far shows that the conditions were different; that the conditions were not sufficiently alike to warrant the comparisons. Objection overruled.

1806 Plaintiff's Exhibits 31, 32, 33, 34, 35 and 36 admitted in evidence.

1807 Plaintiff's Exhibit 45, previously marked for identification in connection with Mr. Cummings' testimony, being outside plant curve for Manhattan and Bronx, a weighted average cost as of Dec. 31, 1914, with the resulting curve up to 1920, objected to on the same grounds as above. Objection overruled. Plaintiff's Exhibit 45 admitted in evidence.)

1808 *Re-direct Examination by Mr. Haight.*

I will state, as a matter of fact, the condition of the Indiana property. The Indiana property, quite unlike the Chicago property which is a single property in a big city, comprised a good many small exchanges and connecting toll lines. It also included a great many properties that had been purchased from competing companies. Chicago has nothing of that sort except possibly the property of the old Illinois Tunnel Company. Indiana is a property largely above ground; Chicago largely underground; Indiana widely scattered; Chicago close together in one big community; Indiana, a property that has grown slowly under the competitive conditions, a property that has grown slowly because the company was poor and could not afford to rebuild and make the additions;

1809 Chicago, on the contrary, was a property that has always grown and kept pace with the development of the city, and additions were made during high prices when necessary.

Additions were made during the periods of high prices in Chicago to a greater extent than in Indiana.

I am speaking from general considerations not from specific data. I know the properties in a general way. A considerable part of it was the old Central Union Telephone Company and a smaller amount, the properties of competing companies that had been purchased. As compared to the Chicago standards the condition of the Indiana property was relatively low. It was not in as good physical condition as the Chicago property. I am making comparisons that are pretty general; I don't want to claim that I have made an inspection of the Chicago property, but I know in a general way how it was built and how it was maintained, and I know the Indiana property as of that time more intimately.

1810 In respect to data from which City Exhibit 104 was prepared, when Mr. Turner was at our place yesterday, Mr. Cummings offered him some books of prices that we had, which include cable prices, but inasmuch as they were not specifically used in forming the basis for Exhibit 104, Mr. Turner said that he was not interested.

I don't recall any specific data that we did use in compiling City Exhibit 104. My mind was impressed with the facts as I had gotten them during the years, the data on prices that we had obtained and had put away in our records, and I carried the distinct impression that the prices went off a little during those three years. It was about that time that we were making our studies in the east, and the rather brief investigation that we made for this case confirmed that judgment.

1812 HARRY G. WESTPHALN, called as a witness in behalf of the defendant, having been first duly sworn, testified as follows:

Direct Examination by Mr. Haight.

My name is Harry G. Wesphaln. I reside in Chicago, Illinois. I am a certified public accountant and for the past ten years have been expert accountant in the Department of Finance in the City of Chicago and have been in the employ of that Department, in that and other capacities, since February, 1914. It has been part of my duty to examine, investigate and check the reports, books and accounts of different utility companies operating in the City of Chicago, including the Illinois Bell Telephone Company.

1813 I am familiar with the accounting methods followed by the public utilities and by the Illinois Bell Telephone Company and I have made a study of the uniform system of accounts for telephone companies prescribed by the Interstate Commerce Commission and by the Illinois Commerce Commission and its predecessor, the Public Utility Commission of Illinois. As an accountant, it is my conception that working capital of a company is the excess of current assets over current liabilities.

I have prepared a statement for the years ending Dec. 31, 1922, 1923, 1924 and 1925 of the working capital of the Illinois Bell Telephone Co. from information originating from its books. It is printed in this booklet.

1814 (City Exhibit 108, said printed tabulation prepared by Mr. Westphaln admitted in evidence.

1815 City Exhibit 109, table prepared by Mr. Westphaln, admitted in evidence.)

1816 W. H. CRUMB, recalled as a witness on behalf of the defendants, testified as follows:

Direct Examination by Mr. Goldstein.

I heard the testimony of Mr. Crunden. I examined the various exhibits introduced in connection with his testimony in reference to the bond yields of various companies. I prepared a tabulation showing the bond yields of the bonds issued by the A. T. & T. Co., the Illinois Bell Telephone Co. and the Commonwealth Edison, as indicated in one of Mr. Crunden's exhibits in the year 1923.

I prepared City Exhibit 110 for identification. The column marked A. T. & T. Company refers to the bonds of the
1817 American Telephone and Telegraph Company Sinking Fund Debenture Bonds, 5½%, dated Nov. 1, 1923, due Nov. 1, 1943, the authorized amount being $100,000,000; offered at 98½ in November, 1923. The column headed I. B. T. Company are the first mortgage and refunding 5's of the Illinois Bell Telephone Company, dated June 1, 1923, due June 1, 1956, the authorized amount being $50,000,000; offered in June, 1923, at 95¼. The last column, Com. Ed. Co. are the bonds of the Commonwealth Edison Company of Chicago first collateral 5's, dated July 1, 1923, due July 1, 1953, being an open mortgage bond of which $15,000,000 was offered at 92½ in December, 1923. The words "high" and "low" are the high and low market prices for each of the bonds during that year, as recorded in Moody's Manual of Public Utility Companies for the year 1928. The list of bonds, their char-
1818 acter, description and high and low prices were compiled from Moody's Manual. The yields were computed from, or were recorded on this exhibit from yields shown for bonds bearing that rate of interest and at the similar maturities as shown in the yield book which bond brokers have.

I prepared a comparative table showing stock yields for the stock of the A. T. & T. Co. and the Commonwealth Edison Co. I prepared City's Exhibit 111 for identification. This exhibit refers to the A. T. & T. Co. and the Commonwealth

Edison Co. The high and low represent the high prices and low prices for the years mentioned, as taken from Moody's Manual for the year 1928.

1819 The yield is computed by dividing the dividends paid by the market price—the dividends paid in the case of the A. T. & T. Co. being $9 per share per year, and in the case of the Commonwealth Edison Co. being $8 per share per year.

—I prepared City's Exhibit 112 for identification, showing the Illinois Bell Telephone Company Chicago Exchange yield computed on Mr. Crunden's basis. I mean that Mr. Crunden, in his testimony stated that he had computed the yields of various companies upon the basis of taking the average investment of those companies as obtained from Moody's Manual and dividing that average investment into the amount available for dividends and interest which those companies had for a given period or for a year. He took, as he stated, the total investment at the beginning and end of each year from which he first substracted any intangibles which he found and then took a simple average of the two amounts; from that he deducted the average current liabilities and in that way found what he called the average investment.

1820 (The Court asked if anybody is claiming 8% on $155,000,000.

1822 Mr. Bangs states: "We haven't anything to do with any issue other than confiscation and the value of our property in 1923.")

1825 I divided up the stocks and bonds of the Illinois Bell Telephone Company to conform to 69.1% for the Chicago Exchange. The 69.1% for stocks and bonds is upon the ratio of the plant in service in the Chicago Exchange, to the total plant in service of the company on June 30, 1923—that ratio expressed in per cent being 69.1 per cent.

(City's Exhibits 110, 111 and 112 offered in evidence. Objection by plaintiff to Exhibit 112. Objection overruled. City's Exhibits 110, 111 and 112 admitted in evidence.)

1826 I am familiar with the method and practice of the Illinois Bell Telephone Co. in making depreciation charges as an operating expense from the time of the formation of the Company to 1925.

"Q. Will you state what that practice has been?"

(Objection by plaintiff; objection overruled.)

1828 Prior to the passage of the 1907 ordinance, the Illinois Bell Telephone Company (then the Chicago Telephone Company) had not adopted a steadfast policy with regard to depreciation charges. A reserve for deferred maintenance account was inaugurated in 1894 and continued to 1907, during which time $6,765,595 was credited to the reserve and charged to maintenance accounts. Of this amount $1,575,000 was transferred to surplus account, leaving a net credit of $5,190,595 to the reserve account. Beginning in 1895 the company began writing down its investment account and charging this reserve account in amounts evidently representing depreciation which had taken place. In this way, the investment account was reduced $3,202,076 between 1895 and 1906. This amount, together with certain adjustments, reduced the credit balance in the reserve for
1829 deferred maintenance to $1,836,714 as of December 31, 1907. On December 31, 1907, the total of these reductions in investment account together with certain other credits to that account were reversed leaving the investment account at its original book cost. As a result of this transaction, the investment or plant account was increased by the sum of $3,767,233, this amount being credited to surplus account instead of the reserve account which had contributed practically the whole of the amount. The transfer of this $3,767,233, together with the $1,575,000 previously transferred to the surplus account enabled the company to pay stock dividends amounting to $1,000,000 in 1900 and $4,500,000 in 1908. These transfers left a credit balance in the reserve for deferred maintenance account amounting to $1,836,714, as of December 31, 1907. This figure is for the company as a whole of which $1,506,004 is properly apportioned to the Chicago Exchange property.

Beginning with the $1,506,004 at the close of 1907, the company's charges to depreciation as an operating expense for the Chicago Exchange for the years 1908 and 1909 were practically equal to the cost of retirements of property during those years. Whatever views the company may have had upon this subject prior to this time, were readjusted in 1910, when the company began the present policy of charging depreciation as an operating expense with concurrent
1830 credits to the reserve for accrued depreciation account. This policy was continued down to and including the year 1925.

I have made a study of the policy followed by other utility companies in regard to depreciation charges. I know whether the policy followed by the Illinois Bell is the same as that followed by other utility companies. In general, it is not.

"Q. Will you please state the difference between the policy of the Illinois Bell Telephone Company and that followed by other public utility companies?

Mr. Bangs: Are you talking about public utilities other than telephone companies?

Mr. Goldstein: Other than telephone companies.

Mr. Bangs: I object to that.

The Court: Sustained: You may make your offer.

1831 Mr. Goldstein: We will offer to show that the policy of the Illinois Bell Telephone Company is different from that of most public utility companies other than telephone companies.

The Court: In what respect?

Mr. Goldstein: That the policy of the Bell Telephone Company is founded upon the assumption that the company should be in a position at all times to make good to its stockholders the difference between the cost of the plant and some value below that cost, based upon straight line methods of applying depreciation. All other utilities excepting telephone companies operate upon the assumption that theirs is a permanent business in which they will never be called upon to make good

such a difference to their stockholders; that the investment of the stockholders is protected if the earnings are sufficient at all times to maintain their plants in the best operating condition and make good the cost of all plant consumed in the service, with a fair margin of safety.

It is with this in view that the method followed by the Illinois Bell Telephone Company for its reserves is much more liberal than that followed by the other public utilities, therefore, in the administration of its policy it should be most conservative and should take all the precautions possible not to create an excess in their reserve.

1832 Mr. Bangs: I object to it.

The Court: Objection sustained."

I am familiar with the instructions of the Interstate Commerce Commission and the Illinois Commerce Commission with regard to the depreciation charges contained in the Uniform System of accounts for telephone companies. I have made a study to determine the amount of depreciation charges that should be made by the Illinois Bell Telephone Company, Chicago Division, to fully comply with these rules. I will describe that study and state the result of it. During the years 1919 and 1920, in connection with the hearing before the Illinois Public Utilities Commission in case 9291, which case was an application of the Chicago Telephone Company for an increase in its rates in the City of Chicago, I made an extended study of the requirements of the company

in order to fully compensate its stockholders for the cost
1833 of capital consumed in the service, for all causes, and

found that for the period beginning Dec. 31, 1890, and ending with Dec. 31, 1918, that the average cost of capital consumed in the service each year during this period was 2½ per cent of the cost of plant and equipment, less land, each year. This represented the experience of the company as a whole, the plant in the City of Chicago being about 80 per cent of the total plant. Reliable data was at hand from which to obtain the average cost of capital consumed in the Chicago Exchange for the years 1911 to 1919, inclusive; this was found to be

2.29 per cent of the average cost of the plant and equipment of the Chicago Exchange property, less the cost of the land, each year. Considering this cost in conjunction with the experience of the company with its entire plant over the longer period I came to the conclusion that an annual charge of two and a half per cent of the depreciable property of the Chicago Exchange would be sufficient to fully compensate the company for the cost of capital to be consumed in service during the succeeding five or ten years with a fair margin of safety.

I prepared a schedule showing the result of my application of two and a half per cent per annum of the average depreciable plant of the Chicago Exchange. City's Ex-
1834 hibit 113 for identification represents such tabulation.

Column A on this exhibit shows the average depreciable plant for each year for the years 1908 to 1925, inclusive, this being the average book cost of the plant and equipment, less book cost of the land, each year.

The column marked "B" shows the amount which would have been charged as the expense of depreciation each year had this depreciation expense been charged at the rate of two and a half per cent, instead of at the rate of approximately five per cent, as was charged by the company.

The column marked "C" shows the actual net cost of capital consumed during the year due to the retirement of units of property from the plant.

The column marked "D" of this exhibit shows the balance in the reserve from the beginning of the period amounting to $1,506,004, which accumulated to $7,790,468 at the end of the period, the accumulation being due to the difference
1835 between the amounts charged to depreciation as an operating expense and the actual cost of capital consumed during the period.

It will be noted that the total amount charged as depreciation expense during the period was $25,110,777, while the cost of capital consumed was $18,626,313, or $6,284,464, less than the amount charged as depreciation expense during that time.

This $6,284,464 added to the $1,506,004, which was the balance in the reserve at the beginning of the period, shows the balance in the reserve as of Dec. 31, 1925, amounting to $7,790,468. (City Exhibit 113 admitted.)

This method (shown in column B of City Exhibit 113) has been commented on extensively and approved in a book entitled "Depreciation of Public Utility Properties" by Prof. Henry E. Riggs, of the University of Michigan. This is a McGraw-Hill publication of 1922. Dean Cooley, dean of the engineering department of the University of Michigan, in his testimony in the Surface Lines case, approved of this method of making depreciation charges.

1836 The Surface Lines case was before the Illinois Public Utilities Commission in 1919 and 1920, when the City was trying to justify the five cent fare.

Two and one-half per cent for expense of depreciation would not amount to forty years, if you take salvage into consideration. You have some salvage there which would reduce the amount.

1837 Q. Has it been approved by the National Electric Light Association and the American Gas Association?

A. It has, yes.

(Objected to by plaintiff; motion to strike answer; sustained.)

1838 I know how the Peoples Gas Light & Coke Co. treats its reserve for depreciation and the method followed by the Commonwealth Edison Co.

Q. Can you describe the method followed by the Commonwealth Edison Company?

A. Yes, sir.

1845 (Objection by plaintiff; objection sustained.)

Mr. Goldstein: We offer City's Exhibit 114, which will show a compilation from Moody's Manual of 1924 of the depreciation reserves of the public utility companies as of Dec. 31, 1923, of the companies listed on said exhibit, showing their plant and equipment, the depreciation reserve, and the

per cent of plant and equipment. Now, in connection with that, shall I also make an offer as to what we are going to show with reference to the method used by the Commonwealth Edison Company and the Peoples Gas Company?

We will offer to show by this witness from information taken from the year book of 1923, the Commonwealth Edison Company—

(Objection by plaintiff; objection sustained.)

1846 *Cross-Examination by Mr. Bangs.*

This computation set forth in Exhibit 113 is based upon the same rate of depreciation charge arrived at in the same way as that I testified to before the Public Utilities Commission. It covers a greater length of time, how-
1847 ever, and more fully substantiates the conclusions I had reached at that time. It covers a greater length of time. It proves out the forecast that I made at that time. It is also in the same form as that which I introduced before the Illinois Commerce Commission. This represents my method of charging depreciation. I base that method upon the amount of property retired by the company from year to year, the cost of capital consumed, as defined in the Uniform System of accounting. I determine that percentage of the amount charged for replacements upon the
1848 basis of the property in service during the year in which the charge is made.

If you have $100,000,000 worth of property in 1924, no matter what the property retirements were in that year, I would charge two and a half million dollars or two and a half per cent of that property as the depreciation expense, because I have found that over a long period of years the charge of two and a half million dollars or two and a half per cent of that property as the depreciation expense, will provide sufficient funds as and when needed to pay the net cost of property retirement which comes along in irregular amounts. Some years it may not be equal to the two and a half per cent, and some years it may be considerably more, and that

two and a half per cent over the period of years gives a fair margin of safety.

That margin of safety is shown by the balance in the reserve for the year 1925 as $7,790,000.

I did not hear Mr. Hill's testimony.

1849 My $5,567,000 is about 8% of $80,000,000—in 1922; 1923 it would be $6,352,000 over $91,000,000—that is about 6½%.

I don't reconcile my testimony with Mr. Hill's.

(City's Exhibit 113 offered in evidence. Objection by
1850 plaintiff. Objection overruled. City's Exhibit 113 admitted in evidence.)

1867 It is stipulated and agreed by the parties hereto, by their respective counsel of record, that neither the original agreement of July 1, 1891, between the American Telephone and Telegraph Company and the Chicago Telephone Company, nor any amendments thereto, nor documents relating thereto, were formally filed with the Public Utilities Commission of Illinois or the Illinois Commerce Commission prior to the proceedings instituted by the plaintiff herein on or
1868 about July 31, 1919, nor was there any formal action taken by either the Public Utilities Commission or the Illinois Commerce Commission relative to said documents other than in its orders entered in case No. 9291 on December 20, 1920, and in case No. 11894 in its order of August 16, 1923.

That neither the original license agreement of December 23, 1881, between the American Bell Telephone Company and the Chicago Telephone Company, constituting City's Exhibit 23 herein, nor the letter of May 2, 1902, constituting City's Exhibit 73A herein, nor the contract of February 1, 1919, constituting Company's Exhibit 7 herein, nor any amendments to any or all of them, or documents relating thereto, were formally filed with the Public Utilities Commission or with the Illinois Commerce Commission prior to the proceedings instituted by the plaintiff herein in case No. 8672 filed by the plaintiff in October, 1918, which case did not relate to the City of

Chicago, and that none of such documents were formally filed with either of said Commissions in any case involving the City of Chicago prior to the proceedings hereinabove referred to as cases Nos. 9291 and 11894, and no formal action was taken by the Public Utilities Commission or the Illinois Commerce Commission relative to said documents prior to
1869 the orders of said Commission hereinbefore referred to entered on December 20, 1920, and August 16, 1923.

That a conference was held between representatives of the plaintiff company and the Public Utilities Commission of Illinois shortly after the effective date of the first Commission Act, effective in Illinois January 1, 1914, with reference to the filing with the Commission by the Company of such agreements with other public utilities as the Commission might require to be filed under the Commission Act, and the said Public Utilities Commission then advised the plaintiff that it did not wish to have filed with it copies of any existing agreements with other public utilities, and desired the plaintiff to use its discretion in determining what subsequent agreements should be filed with the Commission, and that the plaintiff did not file with either of said Commissions any of the agreements above referred to, except in connection with the applications for increased rates hereinabove referred to as cases No. 9291 and 11894, and that the only document of those above referred to, filed before the Commission in case No. 8672 was a copy of the license agreement entered into between
1870 the Postmaster General and the American Telephone and Telegraph Company, which said agreement was identical in form with the contract of February 1, 1919, filed as Company's Exhibit 7 herein, except that the parties thereto were the Postmaster General and the American Telephone and Telegraph Company, and further that the plaintiff has at all times advised the Public Utilities Commission and the Illinois Commerce Commission informally of any changes made in the license contract of February 1, 1919.

"It is stipulated that this stipulation shall not be construed

as affecting in any manner the right of either party hereto to question or to contend for the jurisdiction of said commissions over said documents, or to question or contend for the necessity of the formal approval of said documents by said Commissions, to the same degree as if such stipulation had not been entered into and said facts testified to and admitted in evidence herein.

"And this said stipulation constitutes only a statement of facts in regard thereto."

It is further stipulated as to City Exhibit 46, that the
1871 stock of the Illinois Bell Telephone Company and its predecessor, the Chicago Telephone Company was, as shown in the first column of said City Exhibit 46, owned by American Bell Telephone Company from 1881 to 1899 and that for years subsequent to 1899, it was owned by the American Telephone & Telegraph Company.

It is further stipulated that on October 11, 1926, Mr. U. F. Cleveland, auditor of the Illinois Bell Telephone Company, made an affidavit which was filed in connection with the motion for a temporary injunction in this court which affidavit reads in part as follows:

"That this affiant has not attempted to determine the actual cost to the plaintiff company in connection with the services rendered by that company, that is, the Illinois Bell Telephone Company, for which it is compensated at the rate of 17 per message, but it is the opinion of this affiant based upon his general knowledge of the telephone business and his experience in accounting matters, that the said payment of 17 cents is fair and reasonable to the plaintiff company, and that although any such computation of cost is complicated and presents many questions of judgment, no reasonable computation of the cost of such services would result in less than fourteen cents or more than twenty cents per message."

1872 City Exhibit 115, certified copy of resolution of Board of Directors of Chicago Telephone Company (Illinois

Bell Telephone Company) held November 27, 1918, relating to authority for the execution of the 4½% contract, admitted in evidence.

City Exhibit 84-A, certified copy of resolution of Board of Directors of Chicago Telephone Company (Illinois Bell Telephone Company) dated January 8, 1913, calling stockholders meeting to consider purchase of Central Union Telephone Company, admitted in evidence, subject to subsequent ruling on admissibility.

1873 City Exhibit 116, an analysis made by Mr. Cleveland of the differences between the amounts billed for use of plant for long line service as shown on Plaintiff's Exhibit 15 and the Illinois Bell's portion of those tolls as shown on City Exhibit 44—three pages—admitted in evidence.

City Exhibit 117, Articles of Incorporation and certificate of dissolution of American Bell Telephone Company, admitted in evidence.

1874 City Exhibit 118, Chap. 326 Massachusetts Statute, admitted in evidence.

City Exhibit 119, contract dated December 11, 1899, between American Bell Telephone Company and American Telephone & Telegraph Company assigning license agreement with Chicago Telephone Company, admitted in evidence.

City Exhibit 120, Certificate of Incorporation of American Telephone & Telegraph Company, admitted in evidence.

1875 City Exhibit 121, letter dated January 7, 1913, from George W. Wickersham, Attorney General, to chairman of Interstate Commerce Commissions, admitted in evidence.

City Exhibit 122, communication to Attorney General dated December 19, 1913, signed by American Telephone & Telegraph Company by N. C. Kingsbury, Vice President.

1877 City Exhibit 123, Toll Contract between American Telephone & Telephone Co. and Central Union Company, offered in evidence.

City Exhibit 124, final decree of Judge Dever in Read *vs.*

Central Union Telephone Co., *et al.*, Superior Court of Cook County, offered in evidence.

1882 City Exhibits 123 and 124 admitted in evidence subject to subsequent ruling on admissibility.

1884 Stipulated that the said decree (City Exhibit 124) was subsequently vacated by stipulation.

Cross-Examination of J. G. Wray (Continued).

I understood that you called for the gross additions
1885 and net additions for these six years, for central office equipment, to set out against the gross additions and net additions of the entire property in New York City for those years.

The figures are as follows, and I will read the gross additions and the net additions afterward:

	Gross Additions	Net Additions
1921	$ 7,064,565.10	$ 6,813,346.42
1922	15,864,549.92	15,543,443.17
1923	21,632,524.09	21,138,247.18
1924	45,844,927.35	44,775,048.03
1925	18,419,315.75	16,646,654.47
1926	8,295,227.36	6,302,235.63
The total for the six years	$117,121,110.17	$111,198,974.90

These figures include only Central Office equipment and do not include any buildings that might have been erected for the purpose of housing such equipment.

1904 City Exhibits 86, 87, 88, 89, 90 and 91, Magazine Articles, Advertisements of A. T. & T. Co. and Annual Reports of A. T. & T. Co. admitted in evidence subject to subsequent ruling on admissibility

1909 K. E. THOLIN, called as a witness on behalf of the Illinois Commerce Commission, having been first duly sworn, testified as follows:

Direct Examination by Mr. Haight.

My name is K. E. Tholin. I reside at Downers Grove, Illinois; I am supervising Examiner of accounts for the Illinois Commerce Commission. I have held that position since July, 1921. Prior to that I held the same position with the Public Utilities Commission having been appointed in July, 1920. I entered the service of the Public Utilities Commission of Illinois in May, 1919, as Examiner of Accounts.

1910 My duties, while in the employ of the Commission, have been to make audits of various utilities throughout the State of Illinois; to supervise audits made by Examiners of accounts, and to present reports of such audits to the Commission at formal hearings.

During this period of ten years I have made and supervised many audits of telephone companies and other public utilities in this State.

In addition to the duties I have mentioned, I have from time to time assisted the Commission in holding hearings in rate cases and other proceedings, and have, at various times, conferred with the chief accountant and the commissioners, in connection with the preparation of orders handed down by the Commission.

Prior to entering the employ of the Public Utilities Commission I was for a period of approximately one year employed by Arthur Young & Company, certified public ac-
1911 countants in the City of Chicago. Prior thereto I was employed for a period of five years by the Chicago, Burlington & Quincy Railroad Company, and while in the employ of the Burlington Railroad I prepared the company's operating and financial reports to the Interstate Commerce Commission and to approximately twelve different State Commissions. I also made various investigations and prepared

a great many special statements and reports for the officials of the company. I also made special studies and prepared exhibits for use in rate case proceedings.

In the latter part of the year 1921, I was instructed by the Commission to cause an examination to be made of the books and records of the Illinois Bell Telephone Company, especially pertaining to its operations within the City of Chicago.

Pursuant to those instructions I set several examiners of accounts to work on said books, under my direction. The results of those investigations were introduced into the record made before the Illinois Commerce Commission, in case number 11894, on April 12, 1923, in the form of Tholin Exhibit "A." Certain other data which was assembled under
the direction of Mr. Hammond and myself were intro-
1912 duced into that record as Hammond Exhibits "A" to "I", inclusive.

At about the same time that work was being completed in case number 11894, I was instructed to cause investigation to be made of the books and records of the Illinois Bell Telephone Company, in connection with many of its exchanges in various cities and towns in the State of Illinois, and I therefore at that time placed several men on this work, which work has been proceeding for a period of several years.

Pursuant to the amendment to the Interstate Commerce Act of February 28, 1920, the Interstate Commerce Commission instituted an investigation of depreciation rates, entered in its order of November 2, 1926, relating thereto.
1913 In order to be informed, so as to intelligently pass upon the question of depreciation rates, the Illinois Commerce Commission instructed me to have certain
1914 investigations made of the books and records of the Illinois Bell Telephone Company pertaining thereto. In compliance with these instructions I have kept several accountants at work at the office of the Illinois Bell Telephone Company for the purpose of studying the losses actually realized on account of depreciation, and for the purpose of ascertaining what reliable information is available, and for the

purpose of compiling, in summarized form, such data as may be useful.

Under my direction, some study has been made of such tabulations and studies made by the Company, as have been made available to us.

Within the past few months, when we were informed by the Attorney General that the present proceeding was coming on for hearing I caused some further examination to be made of the records and books of the Illinois Bell Telephone Company, especially of the Chicago Division, with a view of bringing down to date the data in our files.

I have prepared a summary of the fixed capital investment of plant and equipment in Chicago as shown by the Illinois Bell Telephone Company's Books.

1915 (Commission's Exhibit 1 marked for identification.)

I believe this statement entitled "Fixed capital investment" is, in the main, self-explanatory. By following across the page and taking the figures for the year 1925, which is the last row of figures, I may more clearly indicate what the statements show.

The first column shows that on January 1st, 1925, the investment in plant and equipment in the Chicago Division as shown by the companies' books was $110,987,626.

The second column shows that during the year 1925, the gross additions for new property added to the company's plant in the Chicago Division was $21,452,483.

The third column shows the retirements, which represent the book cost of property sold, removed or abandoned, and written off the books during the said years, in the amount of $5,936,341.

The fourth column is simply the difference between the second and third columns and indicates that the net
1916 additions to the book cost of the property, in the year 1925, was $15,516,142.

The fifth column contains miscellaneous transfers of property as between the Chicago Division and other divisions,

such as, for instance, when the City of Chicago annexes some suburban town wherein the Illinois Bell Telephone Company has had one of its suburban division exchanges, which would thereupon be transferred to the Chicago Division.

The last column indicates the balance or total investment in plant and in equipment in the Chicago Division at the end of the year, which at December 31, 1925, as shown by the company's books, was $126,493,467.

These plant accounts represent the cost of the property at the date of acquisition. No amounts have been deducted to show present value.

For instance a unit having a ten year life, and costing $10,000 which was entered on the books at this cost in December, 1916, would still be carried in this account at December 31, 1925, at its full cost of $10,000, although nine-tenths of its value had expired. However, a sum of $9,000 representing nine-tenths of its cost, would have been charged off in past
1917 expenses and would be included as of December 31, 1925, in another account entitled "Reserve for Depreciation." The difference between those two accounts would indicate that the remaining value of this unit was $1,000 at December 31, 1925.

(Motion of plaintiff to strike the portion of testimony which expresses an opinion as to the value of property.)

1918 I am not undertaking to state anything except what appears from the books. I might state here a usual accounting practice in this connection is that the net book value of a property would be the difference between what is shown, on one hand, in investments, and, on the other hand, in depreciation reserve. That among accountants is recognized as being the net book value. I am speaking only in the matter of accounting on this property.

(Above motion to strike denied.)

There is nothing in the property account charged off in depreciation, but there is a depreciation reserve.

1919 The Court: If there is any expression of opinion of value, that is stricken out. The rest of it may stand.

I have made a study of the investment in fixed capital for stations in service and have a tabulation with me.

(Commission's Exhibit 2 marked for identification.)

1920 I prepared this statement from the books and records of the company.

I have included herein figures as of December 31st for each of the years 1921 to 1925, inclusive.

The latest valuation which the Illinois Commerce Commission had before it in case number 11894 was as of December 31, 1921. I therefore started with that date.

The first line shows the total number of telephone stations in service as of the end of each year, as shown by the company's records.

The following lines show the investment in certain types of plant and equipment, as shown by the company's books, divided by the number of stations in service, shown on the first line.

The last line indicates the total investment as shown by the company books, reduced to the unit of one telephone station.

A comparison of the amounts shown on the last line would indicate that the average investment per station as shown by the company's books in 1921, was $127.82, while at the end of the year 1925 it amounted to $159.96.

1921 I have made a study of the investment in Central Office equipment as shown by the company's books and have a statement showing that.

(Commission's Exhibit 3, marked for identification.)

I believe I can best explain this statement by taking one of the lines and following that across the page, explaining what the items in each column mean.

I will take the last line of figures, which is for the year ending December 31, 1925.

The first column indicates that the investment in manual

type of central office telephone equipment, as shown by the company's books as of December 31, 1925, amounted to $27,602,608.

The second column shows that there were 80 manual 1922 central offices in operation on that date.

The third column shows there were 738,731 telephone stations served by this manual equipment.

The fourth column shows that the average investment for company's stations for this type of equipment was $37.36.

The fifth column shows the investment in machine type of central office equipment as shown by the books of the company at December 31, 1925, amounted to $8,227,565.

The sixth column shows there were three machine switching central offices in operation at December 31, 1925.

The seventh column shows that there were 52,033 telephone stations served by this machine switching equipment.

The eighth column shows the average investment per company station for this type of equipment was $158.12.

The ninth column is a summary of the investment in both types of equipment.

The tenth column is the total number of stations in service, served by both types of equipment.

The last column shows average investment in all types of central office equipment per company station, which is $45.31.

1923 By referring to the eighth column it will be noted that the investment in machine type central office telephone equipment, as of June 30, 1923, amounted to $378.94 per station served by that equipment, and that the investment per station in the same type of equipment has been very much reduced, so that at December 31, 1925, it was $158.12. This has been still further reduced to $98.95 at the end of 1928.

This reduction in investment per station is brought about in part by the fact the original installation of central office

equipment had a capacity much greater than the stations actually attached thereto.

There are items of property entering into the plant of the plaintiff that are charged to operating. I will state what bearing it has upon determining the reproduction cost new.

With the extensive use of reproduction cost at price levels very much above the price levels at which property was actually constructed and entered into the accounting system of the utilities, the matter of correct accounting as between capital and revenue, or investment and expenses, becomes of much greater importance, and I now desire to point to a practice in accounting for the expenditures which involves an injustice to the rate payer, when the reproduction cost on higher priced levels is used, and expenditures for new capital have been charged to operating expenses, and thus paid for by the public.

It is comparatively simple to understand that when a large unit of property, such as a building, is worn out, that the original cost must be removed from the plant account, and if this building is replaced by a new building that the cost of the new building should be charged to the company's plant account and not to operating expenses.

However, when we come to the matter of accounting for small items of property, having a value of only a few dollars each, of which the company has thousands in its total plant, it will produce a great amount of accounting if the plant account should be reduced by the original cost of every one of these minor units that is actually removed from the company's plant for any reason whatsoever and replaced by another unit of the same type.

Because of the large amount of work which would be entailed by a strict requirement that every retirement
1924 and replacement of even the most minute unit of property be accounted for through the investment account, a practice has been establised whereby certain more or less arbitrary lines have been drawn to distinguish between so-

called major parts of equipment which the utility is required to handle through the investment account and other so-called minor units which, at least to some extent, the utility is allowed to replace by charges to operating expenses.

It has therefore become a matter of accounting expediency, for the sole purpose of simplifying the accounting, and reducing the amount of labor to the minimum.

The result of this accounting expediency, so far as physical property is concerned, may be explained as follows:

A switchboard might have been installed 25 years ago, having a full complement of minor parts, such as cords, jacks and plugs and lamps and so forth; the switchboard may still be in service but these minor parts have probably been replaced a number of times, so that the physical unit which is to be valued today is not the same physical unit which was entered in the company's capital account but is composed of units added from time to time, replacing the original installation.

1925 In a period of rising prices, such as we have experienced in the last ten years prior to 1923, these replacements of minor parts have been made at prices higher than the original cost which was charged to the fixed capital account. These increased costs, however, have been charged to operating expenses and have been paid for by the rate payers.

The utility then, during the period of high prices, comes before a commission or court and asks to be allowed rates on the basis of the reproduction cost of its property on present day price levels.

In the present case the plaintiff has taken its investment in plant as shown by its books.

(Objection by plaintiff to further testimony on this
1927 line. Objection sustained.)

1929 I have made a computation showing the rate base as of June 30, 1923, similar to that used by the Illinois

Commerce Commission in arriving at its rate base. I have also made that computation as of December 31, 1922.

(Objection by plaintiff; objection overruled.)

1930 Q. How did you arrive at his tabulation?

1931 (Objection by plaintiff; objection overruled.)

1932 The figure $96,000,000 appearing in the bottom line of the Commission's Exhibit 4, was taken from finding No. 9 of the Commission's order. The next figure just above is a total of the above figures. It does not quite equal the $96,000,000. That figure can be disregarded.

1933 The item "Accrued depreciation of $26,000,000" is finding No. 8 of the Commission's order which says the depreciation reserve was $26,000,000. The figure "Total Plant in Service" at the top appears on page 21 of the order. I think there is a typographical error making a difference of $2,000.

The item $4,250,000, Construction Work in Progress, is finding No. 5 of the commission. The item Working Capital, $3,000,000, is finding No. 6 of the Commission. The item Going Value, is finding No. 7 of the Commission.

The figure $5,000,000, Overheads Omitted from Books is finding No. 2 of the Commission, which is exactly $5,000,000 greater than the book value of the property shown on p. 21 of the Commission's order.

1934 Q. And then, how did you arrive at the $20,000,000 appearing after the last amount, "added in consideration of reproduction cost?"

(Objection by plaintiff; objection sustained.)

The Court: The objection to the title "added in con-
1935 sideration of reproduction cost," is sustained.

The amounts in the second column are on a basis similar to the first column, several items being identical. I have used the book value of plant in service at June 30, 1923, and added thereto the findings of the Commission in order to arrive at a figure corresponding to the Commission's

$96,000,000, but as of June 30, 1923, which is the date as of which the company introduced a reproduction cost value.

When I made up this table I did not use the Com-
1936 mission's finding that the property was in 90% condition. I ignored that part of the order.

(The heading of Commission's Exhibit No. 4 "Computation of Fair Rate Base" stricken.)

Q. Did you have any information that led you opposite these items of $20,000,000 in the two columns, to add the legend "amount added in consideration of reproduction cost?" Now, my question is have you any information?

Mr. Bangs: I object.

A. I have.

Q. What was the character of that information; what source?

Mr. Bangs: I object.

1937 One source from which I can arrive at the $20,000,000 is simply from the Commission's order itself. It shows that $20,000,000 is over and above all the rest.

Another source of information was during the progress of the preparation of the order I was in constant conference with the Commission and computed many figures for them, together with Mr. Hammond.

"Q. My next question is, from either of those sources did you receive information that you have placed in this legend: "Amount added in consideration of reproduction cost?"

(Objection by plaintiff; objection sustained.)

1938 (Commission's Exhibit 1, being Fixed capital investment, Investment Plant and Equipment in service, admitted in evidence.

Commission's Exhibit 2, Comparison of Fixed Capital Investment per Station in Service, five years ending December 31, 1925, admitted in evidence.

Commission's Exhibit 3, Investment in Central Office Telephone Equipment per Telephone Station in Service divided

according to Types of Central Office Equipment, admitted in evidence.

Commission's Exhibit 4, omitting therefrom the legend "Computation of Fair Rate Base" and the characterization opposite the $20,000,000 omitting the item "Amount Added in Consideration of Reproduction Cost," admitted in evidence.)

1939 I have prepared a statement showing the average rate base for the years 1922 and 1923. The principle used in this statement is the same as in the previous Exhibit No. 4, except that I have used the average plant.

I might explain how I arrived at that average shown on the first line. In arriving at this figure I have obtained an average for each month of the year by adding the balance at the beginning of the month to the balance at the end of the month and dividing the same by two. I have then added up all these monthly averages and divided the total by twelve, thus obtaining the average plant for the year.

The second line shows the average construction work in progress during that year, which has been computed in the same manner. This amount was then reduced by approximately 29 per cent to allow for retirements to be made when this new equipment was placed in service. This is the same basis as was used by the Commission as shown in its order.

I have then added to the above figures the same items which the Commission included in its finding of fair value, namely, overheads, working capital, going value, and the sum of $20,000,000; from the total of these amounts I have deducted the accrued depreciation which is also on the basis of average plant.

This accrued depreciation is the amount as represented by the reserve on the Company's books, adjusted as follows:

The order of the Illinois Commerce Commission was to be effective October 1, 1923, and therefore the findings of the Commission pertaining to the depreciation allowance would not have affected the balance in the reserve

prior to that date. However, for the purpose of this computation, the average base, is to use it in connection with an exhibit of net earnings for the years 1922 and 1923, which I will later introduce for the purpose of showing what the results for each of these years would have been had the Commission's order been effective throughout its entire 1941 period.

Therefore, I have adjusted the depreciation reserve for this entire period so that it would not include anything more than what the Commission allowed, had the order been effective during these years.

The average rate base thus determined for the year 1922 is $93,583,914 and for the year 1923, $102,104,054.00.

(Motion to strike from said Exhibit "Average Fair rate base;" also the heading "Computation of Fair Rate Base;" also "Amount Added in Consideration of Reproduction Cost.")

If I were asked the same question in regard to the line containing the two items of $20,000,000 in the Commission's Exhibit No. 5 that I was asked in regard to the same items on Exhibit 4, my answer would be the same.

(Commission's Exhibit 5 amended by striking out the legend—"Amount Added in Consideration of Reproduction Cost" the word "fair" appearing in the next heading, and the word "fair" appearing in the next to the last line "Average Fair Rate Base." With such amendments, Commission's Exhibit 5, offered in evidence.

Objection and motion that there be stricken out also the words "rate base."

Commission's Exhibit 5 with amendments, admitted in evidence.)

1942 I have made a similar computation for the years 1924 and 1925. It is Commission's Exhibit 6. This computation is similar to the ones for the years 1922 and 1923 with one minor difference, that difference being that this exhibit

for the years 1924 and 1925 follow the date of October 1,
1943 1923, when the Commission's order would have become effective. The accrued depreciation on this statement is the amounts as shown by the reserves on the company's books with the exception that they have been adjusted beginning with the true effective date of the Commission's order which was October 1, 1923. If I were asked the same questions about the same items in relation to Exhibit 6, I would make the same answers as I did respecting the Commission's Exhibit 4.

(Exhibit 6 amended by striking out from the legend at the top the word "fair"—the legend "Added Amount in Consideration of reproduction cost;" also the word "fair" appearing in the next to the last line.

(Commission's Exhibit 6 offered in evidence.)

(Objection on ground that the words "rate base" should be stricken out. Objection overruled.)

(Exhibit 6, as amended, admitted in evidence.)

I have prepared a statement from the books of the plaintiff showing a summary of the depreciation reserve.

1944 That is Commission's Exhibit 7.

This exhibit entitled "Summary of depreciation reserve," shows the annual amounts which the plaintiff has charged against earnings as representing the portion of its investment which was consumed in each year.

These amounts are composed principally of the direct charge which is included in operating expense account No. 608, Depreciation of Plant and Equipment, and also include a small amount representing the depreciation on tools, automobiles and general equipment which is charged temporarily to a certain clearing account.

I say, they are these accounts which are apportioned to other accounts according to the kind of work upon which these items of general equipment were used in a given month; for instance, the amount shown in this statement as reserve for depreciation in the year 1922, amounting to $3,832,932.00 is

composed of an item of $3,739,869.00, included in the expense account representing depreciation, and the difference is prin-
cipally composed of the depreciation on general equip-
1945 ment.

The second column shows the percentage of relationship of the amount of reserve for depreciation to the balance in plant and equipment at the end of the year.

The third column shows the amount which has actually been charged to the depreciation reserve during each year. These charges to reserve represent the estimated book cost of property which has been retired from service, less the net salvage realized from the disposition of such property.

It also includes extraordinary repairs.

The fourth column indicates the percentage which these charges bear to the plant account at the end of the year.

The fifth column, which is labeled, "Balance in Depreciation Reserve," represents the accumulation of the company's annual estimates of the portion of property consumed in each year. This is the accumulated loss of value or expired capital outlay in respect of only the property still in service as of the corresponding date.

Any accrued depreciation which has been accumulated in this account during its life in respect of property already
retired has been removed from this account at the time
1946 the property was retired. Therefore, this accumulation
of loss of value pertains to property presently in service.

This property is still included in the plant account at its full original cost.

The sixth column indicates, for instance, the year 1922, that the accumulated loss of value in the property in service at December 31, 1922, was 30.44. This exhibit does not show the depreciation reserve balance at June 30, 1923, which I believe should be in this record. This amounts to $27,315,121.

(Motion to strike out all reference of witness to value in his testimony referring to columns 5 and 6.

1947 Any expression of opinion by the witness as to how the property should be valued for rate making purposes stricken out.

Commission's Exhibit 7 thus qualified, admitted in evidence.)

I have prepared from the records of the plaintiff a summary of account No. 103 entitled "Reserve for Amortization of Intangible Property." It is Commission's Exhibit 8 for identification.

The first column indicates the amounts which have been charged against the Company's income for the purpose of amortizing the charge, or charging off the proper an-
1948 nual proportion of the Company's investment in landed capital, as carried in its account No. 207, right of way and No. 211, land?

The second column represents the actual amounts of loss upon retirement of such intangible capital.

The third column represents the balance in this reserve which represents the expired portion of the book cost of this class of intangible capital.

This statement does not show the balance in this account at June 30, 1923. I believe this figure should be in the present record. It is $89,251.

Commission's Exhibit 8 admitted in evidence.

Commission's Exhibit 9 for identification is a table that I have prepared.

1949 This statement is an illustration of the application of the accounting for depreciation. In order to make this as simple as possible I have assumed an investment of $10,000 in one unit of plant, having a life of ten years.

This statement illustrates the result of first, recording accrued depreciation annually on the straight line basis; and, second, deducting this recorded depreciation loss as repre-

sented by depreciation reserve in arriving at the rate base for each succeeding year. It is assumed that the depreciation reserve has been used for the acquisition of additional plant which is included in the total plant and equipment in determining the rate base.

From this total I have deducted the accrued depreciation loss of value or I should say, loss of book cost, as recorded annually on the books.

Thus the book cost of the additional plant offsets the loss of book cost as recorded with respect to the original unit.

I have dealt with a period of eleven years. The four
1950 columns which are numbered 2 to 5 inclusive represent the company's capital invested in one unit of property, costing $10,000.

The next four columns, numbered from 6 to 9 inclusive show how the depreciation is accumulated on the Company's books in the account entitled "depreciation reserve."

These columns in the present illustration cover depreciation only, on the original installation of the one unit costing $10,000. I have purposely left out any entries in the depreciation reserve representing accrued depreciation on any additional property which has been purchased as the inclusion of such items serves no useful purpose but would only confuse the picture.

I am trying to deal with and show a complete picture of one unit of property.

The tenth column represents additional property pur-
chased by the use of the depreciation reserve money.
1951 The eleventh column represents the total investment in plant and equipment being this original unit costing $10,000 plus the property purchased out of the depreciation moneys.

The thirteenth column is identical with the eleventh.

The fourteenth column indicates accrued depreciation to be deducted from the total; I should say, which I have deducted

from the total plant and equipment book cost as shown in column 13.

This accrued depreciation is equal to the balance in the depreciation reserve.

The fifteenth column indicates the resulting rate base or net book cost on which the Company in this illustration might earn a return, it being assumed for the purpose of this illustration, that there has been no change in price levels during the period. As a matter of fact the matter of reproduction cost is irrelevant to this study. The rate base is the difference between plant in the thirteenth column, and the accrued depreciation shown in the fourteenth column.

1953 The only mathematical computation I would like to draw attention to on this statement is the last three columns which shows that if deduction is made of the accrued depreciation as represented by the depreciation reserve, if you deduct that figure from the total book value, you at all times have a reserve of $10,000, which is the original investment in this unit.

(Commission's Exhibit 9 admitted in evidence.)

1955 Mr. Horace K. Tenney enters appearance as associate counsel for the plaintiff.

1957 CHARLES A. HEISS, called as a witness on behalf of the defendants, having been first duly sworn, testified as follows:

Direct Examination by Mr. Goldstein.

My name is Charles A. Heiss. I reside at East Orange, New Jersey. I am comptroller of the American Telephone & Telegraph Company.

1958 The comptroller is the principal accounting officer and has charge of the accounts of the company. Does its statistical work. I also have charge of such matters as insurance, the financial aspect of thrift plans, financial matters, matters relating to provisional estimates, the preparation of the consolidated income tax return, studies as to the financial requirements and recommendations as to the manner in which the company will meet its financial requirements. I have been in the employ of the American Telephone & Telegraph Company 16 years and have been comptroller for about nine years.

1959 The American Telephone & Telegraph Company carries cash available to meet the needs of the associated companies. This practice has been in effect during the period of my employment with the company and I understand was in effect before that time. The American Company aims to keep on hand a considerable cash balance at all times; this balance may range from $40,000,000 to as high as $175,000,000.

(Mr. Goldstein states that inquiry is as to the period prior to 1925 so that any matters spoken of in the present tense refers to the period prior to 1925.)

During the year 1925, the American Company had an average cash balance of about $93,000,000. The Associated companies, of which the Illinois Bell is one, prepare provisional

estimates of their work and undertaking for a year or
1960 more ahead, and, under the license contract, they look
to the American Company for financing them, at least temporarily in respect to their cash requirements.

At the beginning of each year the associated companies advise approximately of the amount of their cash requirements. From time to time during the year as their work progresses, and they have need for money for pay rolls or bills, or for material or other purposes, they draw upon the American Company, and it is for the purpose of meeting such drafts that the American Company aims to keep available at all times a liquid cash balance.

The budgets are made up by the associated companies, and set forth what the associated companies estimate should be done in their respective territories.

Now we review them as any practical business man would review and scrutinize a demand for funds that is made upon him. We do examine the provisional estimates to advise ourselves as to the purposes for which the money is advanced.
1961 If we find that the purpose is one for which we should not advance money we do about the same as any practical business man would do. If there is anything in the budget that we question, we do about it as any practical man of business would we discuss it and on a reasonable man to man basis, we decide whether the matter should be gone on with, or should be changed. We receive reports from the associated companies monthly and annually, and the license contract provides for audit. While the funds are not advanced against any specific objects—that is, we do not say to a company, "Here is $500,000 for a building and here is $100,000 for something else"—we advance them a blanket amount against their needs and naturally we check to see what general application is made of the funds. There are times when the associated companies lend money to the American Telephone & Telegraph Company—in cases where
1962 the associated companies may come into the possession of surplus cash balances in excess of their immediate

needs. The associated companies aim to keep their cash balances at as low a figure as possible, in order that they do not incur a great sacrifice, a very large sacrifice by way of loss of interest.

When an associated company has borrowed money from us we stand ready at any time to take back any excess cash balance which they have, and offset it against the demand loans, or allow them the same rate of interest on it that we receive.

At other times when the associated company has issued bonds and for the time being has more money than it needs immediately, we will take the surplus moneys from them and pay them the same rate of interest which they are committed to pay to the purchasers of the bonds.

The same may be true in the case of a preferred stock issue; if there is a surplus of cash we make arrangements; it is not for the purpose of having the associated companies assist the American Company in financing at all. It is an accommodation to the Associated Companies and a method of helping them run the business as efficiently as it can be run.

1963 We do not tag the dollar, but whatever money we receive from the associated companies goes into the treasury with all other funds and a proper accounting is made thereof so that some of that money may find its way as a part of the fund that goes out to other subsidiary companies. When subsidiary companies obtain advances from the American Company, the rate of interest as a general rule is 6% per annum less 2% if the interest is paid monthly before the 20th of the month following that in which it is due.

1964 The loans are evidenced by demand notes. In some cases we do not even take a demand note but make the loan on open account. In a few cases we have taken one year notes but that is the rare exception. Many times the principal is paid off through stock issues and other times an associated company may come into possession of funds from the sale of property or it may have excess earnings over and

above its need for dividends and it applies them in liquidation of its loan, or the associated company may make a bond issue and in that way liquidate its loan. That is the general picture. When I speak of stock issues, I mean the associated company offers its stock to the American Company as an
investment, and the American Company enters into the
1965 investment relationship and takes the stock at par.

When the A. T. & T. Co. receives money from the associated companies, the rate of interest is usually the same as the American Company charges for funds advanced to its associated companies. Of course, if a bond issue is sold by an associated company, it may have $5,000,000 or $10,000,000 more than it needs immediately.

The American Company takes the money in those cases on the same rate of interest as the associated company has obligated itself to pay to the purchaser of the bonds, the effective rate of interest. In the ordinary case of surplus funds, we pay the same rate that we charge.

The A. T. & T. Co. does not vary its interest charge to the associated companies dependent on the cost of money to it.

I may say in connection with the former question that
many times we take money from the associated com-
1966 panies when we have no immediate need for it, and we carry at all times a liquid cash balance of approximately $20,000,000 in the business on which we do not earn more than 2½ or 3 per cent, and of course, the associated companies could not get any more if they chose to keep their liquid funds in banks, so that this taking of the money from them is a real service to them.

The American Company keeps this money on hand to meet the needs of the associated companies. When the associated companies send money down to New York, we usually accept it on open accounts although, when the accounts are large, we are perfectly willing to give them and have in the past given them as collateral, forms of paper that they may hold, demand notes or liberty bonds or some form of collateral.

I should hope that that is not because the associated companies do not feel that our credit is good.

1967 The reason that we give collateral is that we aim to have the relations between the associated companies and the American Company on the basis of two separate and distinct companies dealing with each other, and we feel that we have no right to ask of them what we would not ask of an independent concern, that is, we try to deal with them exactly the same as we deal with any outsider.

They are supposed to deal with the American Telephone & Telegraph Company in the same manner when they borrow money. I ask them the same credentials and the same paper and the same authority by their boards as their bank would ask if an outsider came to borrow money. I think I have a record of the amount of money loaned by the A. T. & T. Company to the associated companies for the years 1918 to 1925.

1968 The A. T. & T. Company has records of the amount received by it from all the associated companies on account of its so-called 4½ contract from 1918 to 1925. It has records of the average number of telephone instruments in use by subscribers of these same associated companies 1969 for the years 1918 to 1925. I can compute the average cost of money to it during the years 1918 to 1925. It has the facts showing the rate charged to each of the associated companies for moneys loaned to them during that period. I think I can produce the data to show the average return to the A. T. & T. Co. on its current balances during each of the years 1918 to 1925.

There was prepared under my direction, tables ap- 1970 pearing on page 578 of Public Utility Reports 1923-B in the New York Telephone case. I prepared tables relating to the amounts received from all associated Bell companies; the amount received by the American Company from all associated Bell Companies for license payments during the years 1918 to 1921; also a table showing the average loan

to each licensed company by the American Company from the years 1918 to 1920; also table showing average number of sets (per station) and repeaters in use during 1921 by these licensee companies.

I can furnish a statement similar to those just mentioned for the years 1918 to 1925 inclusive.

(Witness is asked for such statement. At Mr. Bangs' request such statement is to include the years 1926, 1927 and 1928.)

1971 There were quite a few instances where the American Telephone & Telegraph Company gave subsidiary companies collateral as security for advances made by them.

1972 For example, I think the time we took the remainder of the proceeds of the 1923 bond issue of the Illinois Bell, we turned over certain government securities.

When we took the proceeds from the bond issue of the New England Company, we gave them either U. S. government securities or demand notes of associated companies. The government securities were not for the purpose of satisfying requirements of the trust deed under the bond issue.

Of course, we do not, under little advances such as $500,000 or so from the associated companies, give any collateral, but if the amount is substantial and good business procedure would call for it, we would do it. The amount on which collateral would be given would depend on a person's judgment and the size of the company.

1973 In a reverse situation where the local company borrowed from the A. T. & T., we never took collateral from them. It has not to my knowledge taken any security for loans made. When it gives its collateral, it usually makes an agreement as to the interest which will be paid and when the interest will be paid and the terms, and so on.

1978 The American Company raises funds to meet the cash requirements of its associated companies through the sale of its own stock and occasionally through the sale of bonds and also some of the money that it advances to the

associated companies comes from earnings from miscellaneous sources, but it does not raise the money specifically to buy stock in the associated companies. That investor relationship comes along after the funds have been advanced for construction and other purposes.

1979 Substantially the same procedure as to loans to associated companies is followed with reference to the Bell Telephone Securities Company. The American Company makes small advances to the Bell Telephone Securities Company, and I think the rate of interest to the Bell Telephone Securities Company is about 5 per cent, because the turnover of the loans is very rapid.

The Bell Securities may take $500,000 or $1,000,000, and in two or three days afterward pay it back, and when funds advanced to the associated companies are advanced there is little or no possibility that they will ever come back to the American Company in liquid form. They will come back to the American Company in stock certificates in which the American Company is investing in the securities of the associated companies. The average rate of dividend on the stock that the A. T. & T. Co. takes from the Associated Companies varies. Most of the companies pay 8%, one or two pay 7%, and I think one pays 6%.

1980 The long lines department of the A. T. & T. Company is a separate and distinct department which operates the long distance service. It operates the lines which extend from one state into another and across the continent tying together the lines of the local companies into one National System of telephone lines. It is just a department of the American Company. It is the American Company. The American Company cannot well advance money to itself. We get up a budget for the long lines after the long lines know what its requirements are and when they have need of funds we supply them and the earnings of the long lines are turned into the general funds each month. The long lines department is separately operated and it has a separate and distinct per-

sonnel. It has separate and distinct accounts which
1981 are just as distinct from the remainder of the accounts of the American Company, almost as distinct as the accounts of the Illinois Bell are from those of the American Company. But it is a part of the American Company. It pays or it is charged up with license revenue in the same way as the associated companies.

I cannot segregate the cost of the license contracts to separate companies. We receive monthly reports from the subsidiary companies showing their construction work, the progress they are making. To the best of my knowledge, the Illinois Bell Telephone Company sent budget requirements to the A. T. & T. Co. during the years 1918 to 1925.

1982 The funds from the bond issue sold by the American Telephone & Telegraph Co. for the year 1922 went into the general treasury and were disbursed for any requirements which were presented to the American Company. We do not tag the dollar. We cannot keep the dollars from the bond issue separate from the dollars which we receive for dividends or the dollars from other sources.

I do not know the total number of employees of the Illinois Bell Telephone Company who owned stock in the American Telephone Company during the years 1918 to 1925. I don't know how much they owed on the stock.

The annual reports of the A. T. & T. Co. are sent to all stockholders if the mail gets them there. That is the custom.

1983 All stockholders of the A. T. & T. Co. have voting power. Stock of the American Telephone Company is sold to the employes of the associated companies, including the Illinois Bell, under an employes' stock plan, which permits any employe who has been in the service of any Bell System company, or subsidiary Bell System Company, for a period of six months, to buy one share for each $300 of salary. or part thereof, at the respective price at the time the employe subscribes.

That installment payment on that stock is paid for by installments of $3.00 a month. It takes about three years to complete a payment and when the payment is completed, the certificate is issued and the employe then becomes a stockholder of record. Now, if the employe leaves the service of the company before that time or dies, his money is refunded with an allowance of 6 per cent for interest.

1984 I think as an incidental matter, the employees of local companies have pride in the development of the interests of the Bell System and sell stock of the American Telephone & Telegraph Company under plans that have been established. That is a plan that the Bell Telephone Securities Company has established in order to make the securities of the Bell System and those of the American Company readily
1985 available to the public, if they care to buy them, and in that way extend the ownership of the securities; and in extending the ownership of the securities they increase the credit of the system and the ability for the system to sell its future securities. All of the stock of the Bell Telephone Securities Company is owned by the A. T. & T. Company.

Generally, I am familiar with the condition of the Central Union Telephone Company from 1913 to 1920. I am
1986 not familiar with the records of the Central Union Tele-
1987 phone Company for the year 1913. I do not know the average amount of indebtedness owed to the American Telephone & Telegraph Company from the Central Union Telephone Company for the years 1913 to 1920.

1999 Whether the sale by Central Union to the Illinois Bell, Indiana Bell and Ohio Bell gave the Central Union sufficient assets to pay off its indebtedness and to establish a value of $100 per share on the capital stock you will have to get from someone connected with Central Union.

The Illinois Bell bought the Central Union property and gave its notes for it and when the Illinois Bell issued its bond issue in 1923 it liquidated those notes.

2000 For quite a period after the Indiana Bell purchased the Central Union properties in 1920, the A. T. & T.

Company did not receive any dividends and for the first few years the Indiana Bell was not able to pay its interest. Subsequently it paid it.

(Motion of Plaintiff to strike answer.)

2001 (Mr. Bangs offers in evidence certified copy of order of Public Utilities Commission of Illinois approving purchase of Central Union Property, as Plaintiff's Exhibit, 46.)

2027 *Cross-Examination by Mr. Bangs.*

I will give an example of the method by which the associated companies carry their budgets by showing the budget of the Illinois Bell.

In the fall of each year the associated company itself announces, that is, the Illinois Bell surveys the situation ahead of it and what is needed by way of new construction and what growth is ahead of it, and what revenues it expects to
2028 receive and what its expenses will be, and what materials and supplies it will need, and in general it draws a picture of what is ahead for the next year, and for the second year and then an estimate of several years ahead.

Now as a result of that provisional estimate made in 1927, for the year 1928, the Illinois Bell finds that it will need over and above its own cash reserve, $19,400,000; and I am giving you the facts now for the year 1928.

Now we receive the budget and we review it and the Illinois Bell advises us that that is the money it will need.

Now if everything is in order, and the program seems to be a reasonable one and it seems that we have no reason to doubt that it is a reasonable one, we advise the Illinois Bell that we will be ready to meet those cash requirements as and when they need them, of course, subject to furnishing us the necessary authority from the Board of Directors for borrowing; and they give us sufficient notice in advance so that we can have the funds available.

2029 That program is reviewed again in April and again in July, and throughout the year. Changes may take

place in the program and the Illinois Bell may not need the $19,000,000 or it may need more than $19,000,000.

As a matter of fact, in the year 1928, its calls were for $12,715,000 instead of $19,400,000, which it had requested.

There was an actual advance of $12,715,000 to the Illinois Bell in the year 1928.

(Objection by city; objection overruled.)

On direct examination I was asked a question as to the license contract service and whether it was possible to compute the cost for a separate subsidiary company and I replied it was not possible.

2030 It would be possible, in my judgment, to make a reasonable allocation of such cost upon the basis of revenues, expenses, plant or number of stations. It is my opinion that the best basis of approach is the revenue basis, that is, the basis upon which payments are made to the A. T. & T. Company. I can give the amounts which the American Company has loaned to its associated companies at the end of any year as compared with the amount of money which it holds by way of loans to it from its subsidiaries.

2031 For instance, in the year 1920, the average loans to the associated companies by way of demand loans and open accounts was about $188,000,000; in 1921, about $189,000,000; in 1922, $135,000,000; in 1923, $132,000,000; and in 1924, $183,000,000. In 1928, $174,000,000; that is, that is the average amount outstanding during the year.

The amounts during those years loaned by the subsidiary companies to the A. T. & T. Company are as follows:

1918, $687,083; 1919, $386,379, average for the year; 1920, $3,568,252; 1921, $15,712,298; 1922, $17,124,468; 1923, $11,382,349; 1928, $1,397,560.

If the associated company puts out a bond issue, then the amount which we take from them and carry for them
2032 and relieve them of the burden of interest charge thereon, is large—if there isn't any local financing dur-

ing the year—is apt to be small—because as a rule these amounts are left with us only for short periods until the company requires funds for development.

The American Company does not look to its associated companies to finance it. The American Company has undertaken to finance its associated companies and it does that job, and whatever small loans the associated companies may make to it, are simply incidental and an accommodation to them.

We handle all the accounting matters, all accounting questions which arise, so far as the Illinois Bell is concerned and which require rulings on the part of the Interstate Commerce Commission.

In addition we prepare the accounting methods dealing
2033 with various subjects such as revenue accounting, plant accounting, pay roll accounting, motor vehicle accounting, and we help the Illinois Bell so far as accounting matters relating to depreciation are concerned, with the Interstate Commerce Commission.

In the present proceeding before the Interstate Commerce Commission with reference to the depreciation accounting, the American Company is representing the Illinois Bell to the extent that the accounting department is interested.

We do not design all the forms that the Illinois Bell uses. We design certain essential basic forms, but they are simply as a means of assisting the company in working out in a uniform way or in the best way I might say, the doing of a particular thing, after we have studied a problem from every angle and have come to the conclusion that there is one way that is better than any other way and then design a form, and we feel it is of assistance to the Illinois Bell to have that form available.

2034 We do not do any actual accounting for the Illinois Bell. We give them advice on such matters as to the best method of installing rotation billing, stub plan accounting, the best methods of machine billing, the best methods of toll billing, the using of toll billing typewriters and we make

computations for them in connection with the annual premiums under the pension plan, and numerous other services of that character.

2035 I am familiar with the provisions of the license contract between the American Telephone & Telegraph Co. and the Illinois Bell Telephone Co. as to the furnishing
2036 of financial service to the Illinois Bell Telephone Co. by the A. T. & T. Co. I am of the opinion that we have very adequately rendered the financial service called for in that contract to the Illinois Bell Telephone Co. and have served it in the same manner as we have served very associated company.

The basis of my opinion is as follows: In the fall of each year a provisional estimate is prepared by each company, and that provisional estimate gives a statement of its financial requirements, its net financial requirements for the ensuing year, and it is on the basis of that statement that we make our preparation for financing the companies.

In the year 1918 the Chicago Company said its requirements were about $4,000,000; the net cash taken in that
2037 year was $3,966,000—and I am giving these figures in round numbers and dropping off the odd dollars.

For the system as a whole, the estimated cash requirements of which we were advised were about $52,000,000.

Now for the year 1919, the Chicago Company stated its requirements at $6,676,000; for the year 1921 at $5,020,000; for 1922, $12,350,000; for 1923, at $6,600,000; but that was a net figure, and did not include its requirements to meet the bond issue which came due in that year. Neither did they cover the requirement in connection with the Central Union note.

In the year 1924, $10,080,000; for the year 1925, $15,327,000; for the year 1926, $15,612,000; for the year 1927, $18,153,000; for the year 1928, $19,400,000.

Now, these were the amounts which the Illinois Bell and its predecessor, the Chicago Company told us at the beginning

of the year they would require, the amounts against which we had to make provision in the form of available cash or cash equivalent.

Now the amount taken in each year may have exceeded
2038 that or may have been less. I will give you the amount of net cash taken; in the year 1918, $3,966,000; in the year 1919, $2,600,000; in the year 1921, $5,951,000; in the year 1922, $9,911,500.

For the year 1923 I do not have available here the actual amount of cash drawn against their construction program by reason of the fact that the figures which I have, are combined with other data relating to the financing under a bond issue; in 1924, $10,771,000; in 1925, $15,364,000; in 1926, $10,800,000; in 1927, $12,167,000; 1928, $12,715,000.

Now, in order that you may compare these figures with the total, the estimated total requirements, of all the associated companies, so as to determine whether approximately the Chicago Company participated proportionately, I will give you the estimated total requirement of all of the associated companies as set forth in their provisional estimate.

For the year 1918, $ 52,000,000.
For the year 1919, $110,000,000.
For the year 1920, $105,755,000.
For the year 1921, $100,000,000. About.
For the year 1922, $105,800,000.
2039 For the year 1923, $139,000,000.
For the year 1924, $242,000,000.
For the year 1925, $232,000,000.
For the year 1926, $189,500,000.
For the year 1927, $175,000,000.
For the year 1928, $185,000,000.

Now in any one year, a particular company may require an amount more than its proportion to the total as compared with its size and its station, and in another year it may require less.

That is due to the fact that you may have in one territory

in one year a tremendous demand for construction; you have had a sleet storm or you may have a tremendous expansion of population. The contract is an agreement to aid the company in providing its financial need and the picture must be taken over a long period; but whether we have performed what we have agreed to perform, cannot depend on one year's relationship or on one year's picture, or even on the picture of two or three years combined.

2040 You are probably familiar with the development of the population in and about New York City. I think the growth of population there has probably been greater than in any other section of the country. You know of the expansion of the suburban districts and the necessity of keeping the service consistent or adequate to meet the great demands in respect of business.

Chicago now has the same problem which is indicated by the fact that in the last four or five years the demands for money from the Chicago Company have been very materially greater than they were in earlier years, and I am not taking away any glory from Chicago when I am speaking of New York City; but mention was made in the statement which I was asked to prepare and file, which was based on a statement which was submitted in the New York case; there would appear to be this fact: That the New York Telephone Co.'s loans on an average were greater than any other company's loans.

2041 In the first place the New York Company is probably two or three times larger, or it was then, than any other company, and so naturally would call for greater financial services, but then there comes into the picture other matters such as these, which determine the size of the average loans which a company may have at any time.

The New York Company owned the property in the state of New Jersey, in the northern part of the state of New Jersey, and it owned the stock of the company operating in southern New Jersey. The people of New Jersey were de-

sirous of having a company of their own. They wanted a New Jersey Company and it was appreciated that they were entitled to a company of their own.

That presented the situation of selling the New Jersey property to a company organized in New Jersey; and the New York Company didn't want to own stock of that Company; it could not simply turn over the property and take their company stock, but it followed, that it should limit its operations to a company doing business in New York State alone, and consequently, it prepared for the time when it would sell this New Jersey property and when it would
2042 be in a position to turn over its interest in New Jersey to the American Company and establish a direct relationship between the American Company and the New Jersey Company, which naturally meant that the best way to perfect the transfer would be for the New York Company to sell its property to the New Jersey Company, and the New Jersey Company issue its stock to the American Company and the American Company give credit to the New York Company for the amount which it received for the New Jersey property.

So you can see as an illustration the kind of thing which might accumulate, on the part of an associated company, quite a large demand loan indebtedness to the American Company.

The chart which I am preparing will show that in certain years, certain companies had large demand loans indebtedness to the American Company, in other years they had
2043 practically none.

The chart will show that in any year there may be as many as five or six companies who have relatively small or no average balances owing to the American Company on demand loans and those same companies two or three years later, or five years later may have large balances owing.

A Company may desire to issue bonds in the future and therefore it would certainly be wise for the Company not to issue stock.

Now, there is only one way for it to proceed, and that is to borrow all the money that it can on short term paper or on demand notes until the time comes to issue the bonds and then use the proceeds of the bonds to pay off its temporary borrowings.

If that Company were to sell stock, when it came to the time of the issuance of the bonds, it either could not issue the bonds or it would be over-financed.

The average in any one year is in my opinion of no importance insofar as the American Company's fulfilling its obligation to render financial service under the license contract, is concerned.

2044 There are two companies in which the A. T. & T. Co. owns only a minority interest. They are the Southern New England Telephone Company and the Cincinnati Suburban Bell Telephone Company. We own approximately thirty-one to thirty-two per cent in each case.

By "over-financing" I mean that a company may have more stock outstanding than its financial picture justifies as being sound; or it may have more stock and bonds outstanding than its financial picture justifies, and if it keeps a certain part of its liabilities in fairly short term paper, it can always liquidate those and adjust the liability side of its balance sheet to its assets.

2045 When the New York Company sold its New Jersey property to a separate company, it received approximately $80,000,000. The transaction was approved by the New Jersey Commission.

Now, I can illustrate there what we had in mind. The New York Company was accumulating demand loans from the American Company, and if the New York Company had sold the American Company stock and had established an investor relationship and had cleared those loans from its books before it sold the New Jersey property, then the New York Company would have had the stock outstanding as permanent securities; and then when it came to the point of selling its New Jersey property, the New Jersey Bell would have been

required to turn over to the New York Company $80,000,000 in cash or cash equivalent, or a note of some form or other which the New York Company would have been required to dispose of in due time.

Now in this transaction it was felt better that the New York Company should not liquidate its demand loans
2046 through stock, and that when the time came to sell the New Jersey property, it should have the American Company buy the stock in the New Jersey Company and give it credit against its demand loans for the proceeds of the property which the New Jersey Bell was paying, and that kept down the New York Company capital stock to the amount necessary, or what it deemed necessary against the property which it had in the State of New York. Otherwise the New York Company would have had a larger capital stock outstanding than it needed after it sold its New Jersey property.

The American Telephone Company has the same form
2047 of license contract with the two companies in which it owns a minority interest. Those companies make the same payment and receive the same services. When we have before us the chart that I am preparing, showing the ten years' experience in financing subsidiary companies, it will show that the Cincinnati Suburban Company seldom has any demand note indebtedness to us.

In fact, I do not recall of any case in my experience with the probable exception of one and I am not certain as to that, when the Cincinnati Suburban owed us any money on demand indebtedness.

They insist immediately upon establishing an investor relationship to the American Company. In fact, their method is to issue their stock in advance of the time they need the money and to borrow, $100,000 or so from the banks, temporarily, and then to issue stock and carry the surplus from the stock in the banks until they need it.

The Southern New England Telephone Company does resort to a little larger borrowing. In practically every year,

for the last five or six years, the Southern New England Telephone Company has put out a stock issue to take up its
2048 demand note indebtedness, and its average balances with us have been very small; at many times it has had no average balance of loans with us.

In those two companies which we do not control, you will find a greater use of the investor relationship.

I explain the phrase "investor relationship" as follows: When a company borrows from us, of course it is in a debtor relationship to us. It has a contract; it must pay interest on its indebtedness. That contract is to pay interest and to pay the principal, which comes ahead of the claim of the stockholder for dividends, and it may follow mortgage indebtedness, but it does come ahead of the claim of the stockholder for dividends.

Now, when a company sells its stock to the American Company it establishes an investor relationship and it puts upon the investor all of the obligations and all of the chances that any one takes who buys stock in a corporation, as to whether he will receive dividends, which depends on whether they are earned.

2049 If a company is liquidated, the stockholder gets what is left after other obligations are paid, and by the investor relationship I mean the relationship between the ordinary stockholder and a corporation in which he invests, which implies all the risk that the stockholder takes. A debtor relationship is decidedly more advantageous to a person who furnishes the funds.

The American Company has taken stock in subsidiary companies where it did not receive dividends. There is no guaranty as to dividends. We take whatever the Company is able to pay. The companies in no case have paid over 8 per cent, except the Cincinnati Suburban, which is a non-controlled company. It has paid 9 in the last few years.

2050 I think that emphasis should be placed on this point, that the real value of the financial service received by the Illinois Bell is not the fact that it may at any time be in

a position to go to the American Company and get $10,000,000 or $25,000,000 on demand notes, but the real value of that relationship consists in the fact that the Illinois Bell has available the funds which it needs for construction and other purposes when it needs them; the Illinois Bell like all other associated companies has very few, if any, liquid assets.

It could not go to a bank in Chicago and borrow ten million dollars or fifteen million dollars because the bank would immediately look at its liquid assets and seeing none it would realize that whatever advances were made would probably be invested in permanent assets, and banks as you know, are loathe to advance funds temporarily against permanent investment.

Now, the Illinois Bell Company has the assurance when the American Company tells it that it will have its financial needs for any year met, that it can go on and hire its men, prepare for its force, and make commitments as to its equipment
2051 as to materials needed and go ahead with its program to carry out the demands for service made upon it, and it is relieved of the necessity of carrying in advance, large balances which it would be required to carry if it were required to do a permanent financing.

Now, of course, if the Company does finance a year's program ahead, such funds as it has on hand are simply for very short periods, and the interest lost is not outstanding.

Then this financial relationship also creates a situation where the Illinois Bell can turn over to the American Company without material loss of interest, any surplus funds which it may have at any time in excess of its needs.

Further, another factor in this relationship is that if it wants to sell bonds, as it did in 1923, it has the assurance that it can come to the American Company and with the American Company's credit back of it, it can go to the bankers and get the most advantageous terms so far as interest rates and, so far as other things are concerned, in putting out its indebtedness; and it knows that if in such case it has surplus
2052 funds the American Company will assist them in carrying those funds without loss; and the Illinois Bell also

knows that it can come to the American Company and that the American Company will serve it in any possible way in making the financial transaction an efficient and economical one.

If the Illinois Bell had a catastrophe, in which it required, we will say, $10,000,000, or $25,000,000, or even $50,000,000 to rebuild its plant, or more, the American Company
2053 would assist it in obtaining funds in the most advantageous way, in the most economical and efficacious way, and if the American Company had the surplus cash on hand, to the extent that it had that cash, it would be available to the Illinois Bell.

We render the Illinois Bell exactly the same service and take care of their financial interests in just the same way as we would if it were our own property.

2054 There are companies in practically all of the states which own the property, which have title to the property devoted to the rendition of long lines service.

Now, those companies exist entirely as title holding companies; in many states a foreign corporation does not have the right to condemn property for right of way. And all of the plant, property and revenues of all of these companies is carried as one unit on the books of the American Company. There are contracts, formal contractual relationships with these companies but the purpose of the companies is merely for the purpose of holding title to the right of way property.

A list of the companies appears in the annual report filed with the Interstate Commerce Commission.

2055 I am familiar in general with the license contract. There are a great many services called for in that contract other than the financial services. There are services with respect to engineering advice, research service, accounting service, service in connection with the benefit matters, employee relations, traffic, and all phases of operation, commercial, advice and assistance of any character that a company may call upon us to perform. I can make a reasonably accurate determination of the cost to the American Company

for rendering the services under the license contract. Of course, in view of the way in which the work is done, and the functions of the American Company, there may be involved certain estimates, but I think those estimates can be made with reasonable accuracy to show in a general way and
2056 in a fairly accurate way of the overall cost of performing this license contract service.

That is, such cost as we incur in giving advice and assistance, the research work, any assistance of any type, in accounting, in operation, in any of the things covered under the contract and the matter of taxes you can estimate those. We could estimate or we can compute the cost of the assets which we have devoted to the performance of this service.

We can make a fairly accurate estimate of the differentiation between the cost of money to us and the receipts which we receive from that money, either when it is held in the American Company as a cash reservoir available to all of the companies, or, if it is loaned to the companies on demand notes.

The operations of the long lines are kept entirely separate and distinct from those of the American Company, and they are just as separate and distinct as the accounts of the Illinois Bell are from those of the American Company except at the end of each month and at the end of each year and for
2057 the purpose of reporting to the Interstate Commerce Commission and other commissions and for our own purposes for reporting to stockholders, we combine the accounts of the long lines with those of the general department to get the overall picture for the company.

I can testify now, if I am asked to do so, as to my estimate of the cost to the American Company of rendering the services under the license contract for the year 1923. 1923 is a normal year.

2058 *Re-direct Examination by Mr. Goldstein.*

I believe I can say that I kept the books of the American Telephone and Telegraph Co. accurately as to the amount of loans and advances made to the system in the years 1918 to 1925. We have an audit made by a very high-type firm of certified public accountants, and in each one of those years we had their unqualified certificate that the accounts of the comptroller and the treasurer were correct. To the best of my knowledge, the books of the Chicago Telephone Company during the years 1918 to 1925 were kept accurately as to showing the amount of advances received from the A. T. & T. Co.

2059 I am certain that if any cash was received by the Chicago Company during the years 1918 to 1925, by way of advances, they would show on the books of the Chicago Telephone Co., and, in addition to that, I am certain that the accounting staff of the Illinois Bell would help unravel any entries which might combine two or three transactions.

If the books of the Chicago Telephone Co. for the year 1918 show that no advances were made, I would still stand by my statement that the Chicago Company received $3,966,000 in 1918 by way of advances from the A. T. & T. Co.

I said in introducing those figures that they were rough or they were approximate estimates and not the exact amount. I got those estimates from my own records in New York.

2060 If that statement as to the amount of advances is to go into the record, I would prefer to check it and submit a corrected statement and have it take the place in the record of the figures which I have given. I have had no opportunity to check those figures back. I drew the figures from certain papers which I had with me here in Chicago. The figures which I have with me were taken from the books of the company.

2061 I prepared or had prepared under my supervision the average loans to licensee companies for the years 1918 to 1920 that were filed in the New York Telephone Co. case.

If the figures filed in the New York Telephone case showed no advances in 1918, the figures I gave this morning—that is, $3,966,000, cash advanced to the Chicago Telephone Co. would still stand as my testimony, because there is a very decided difference between the two statements. The statement submitted in the New York case was of quarterly balances owed by the Illinois Bell to the American Company. The statement to which I testified this morning was that during those years it furnished the amounts which I have stated there. Those are the amounts which we furnished both in the form of demand notes and in connection with the sale of stock by the Illinois Bell.

2062 If the Illinois Bell did not sell any stock and its books did not show the advances that I indicated in my testimony, I would stand by the testimony which I gave. I am very certain that the figures which I gave this morning correspond with the books of the A. T. & T. Co., except as a matter of abundant caution, I always like to check back any figures which I give for a record.

In connection with the sale of stock by the Illinois Bell or other associated companies, the sale of the stock may be made after the liability is incurred, or in any of the following

2063 ways: The Illinois Bell may have borrowed the money from us on demand notes and then during the middle of the year decided to issue stock, and it might take a part of the proceeds and pay off the loans, or it may have cash available for the needs of the remainder of the year or it might have waited until the end of the year and drawn the money from us and then issued stock, and then paid off the loans; or it might have said at the beginning of the year that our program this year is $10,000,000, or $15,000,000, and we are going to use $10,000,000 or $15,000,000 and issue $10,000,000 or $15,000,000 of stock if we can sell it and then use the stock and have the funds available. And one of those may have been used; there is no standard, stereotyped way of doing it.

There is no contract between the companies to pay 8 per cent dividends on stock.

2064 When the American Cmpany buys that stock, it enters into an investor relationship, and it takes its chances, and that is a separate and distinct form of transaction from that of debtor relationship. We make the funds available to subscribe for stock and pay cash for it as part of the service under the 4½ per cent contract. We say to the Illinois Bell—"If you want to sell your stock to us, the funds are available for you."

The budgets which the Illinois Bell submitted from 1918 on, were for the entire company, both the Chicago Division and the rest of the state.

2065 With reference to the sale by the New York Telephone Company of its property in northern New Jersey, the first request came from the people of the state of New Jersey wanting a separate company. The next party in interest would be the New York Telephone Company.

2066 The New York Telephone Company might discuss it with the American Company, it being the owner of its stock and naturally would discuss it. It first originated with the people of New Jersey; then it would go to the New York Telephone Company and their officers would determine whether it was a wise thing to sell the property in New Jersey or not. It was finally decided to sell the property in New Jersey to the New Jersey Bell Telephone Company. Naturally the New York Company would not be bothered by the ownership of stock in New Jersey. It desired to have the New York Company limited to the affairs in the State of New York and the natural thing would be for the New York Company to desire that the American Company should own the stock of the New Jersey Bell Company just as it owns all other companies. There is nothing mysterious about it. So the American Company took the stock.

2068 The contract (between A. T. & T. Co. and Illinois Bell Co.) speaks for itself. We agreed to supply money to provide any temporary financing in any financial matter. We may go beyond what the contract literally demands of us in the interest of serving our companies and to be assured

that the payment we receive has ample services back of it.

2070 I haven't any opinion as to whether in the case of a catastrophe that would wipe out the Chicago Telephone Company, there is an obligation on the A. T. & T. Company to advance money under the 4½% contract, but we would stand back of the Chicago Company to our utmost limit

2071 because we have a license contract. I prepare or have prepared under my supervision, the income tax returns for the A. T. & T. Company and the Bell System. I think that the Company has been filing a consolidated income tax return from the time that the government required or permitted consolidated returns. I think there have been one or two subsidiary companies included in these consolidated income tax returns which have been operated at a loss and had no taxable income. I think one year or so the Indiana Bell had a deficit and that was included.

2072 We make up a consolidated return as a whole and then in determining the allocation of the total tax, we determine how much the Company would have been required to pay itself, if it had made an individual return.

Of course, there may be differences, and under that theory, the company which is required to make up the return by law, may be called upon to bear the differences, and if there happens to be a company which has a deficit in any one year, temporarily the Company that makes up the return gets the benefit of the deficit; but under the law as amended, that deficit company has three years to take advantage of that and the chances in the long run are that the company making up the return is out of pocket more money than in pocket as a result of it.

If the Illinois Bell gave us facts as to its return and those facts were not correct when the department examiners examined the return and develped them, naturally we

2073 would go back to the Illinois Bell. There is no agreement under the license contract that we shall absorb errors.

Re-cross Examination by Mr. Bangs.

The figures which I gave this morning (as to amounts advanced by the A. T. & T. to Illinois Bell) were drawn in Mr. Bangs' office this morning from certain papers which I had in my posession and I would like very much to check them before they are final.

2074 The figures I gave included money advanced whether we took demand notes or whether we took stock.

Re-direct Examination by Mr. Goldstein.

The exhibits that I am going to prepare will show the average amount of loans outstanding for the year, computed by us; they will not show the stock purchased.

Re-cross Examination by Mr. Bangs.

I have before me a sheet which shows the stock issues of the Illinois Bell for the years 1916 to 1929.

Under the Commission's order No. 4696, dated March
2075 23, 1916, $3,000,000 and the dates of payment were 50 per cent on the 1st of July, 1916 and 50 per cent on the the first of October, 1916;

Under the Commission's Order No. 6495, dated March 28, 1917, $6,000,000, payable 50 per cent on the 1st of July, 1917, and 50 per cent on October 1st, 1917;

Under the Commission's Order No. 8225, dated July 16, 1918, $4,000,000, which was payable October 1, 1918, and which was sold as of October 1st and paid for as of October 1st, 1918.

Under the Commission's Order No. 11733, dated August 23, 1921, $10,000,000. That was sold August 24, 1921, and a single payment received therefor;

Under the Commission's Order No. 12433, dated June 15, 1922, $10,000,000, to be paid 50 per cent June 30, 1922, or July 15, 1922. There was an option there, 25 per cent on September 30, 1922, and 25 per cent on December 30, 1922.

Under the Commission's order No. 13158, dated May 9,

1923, $10,000,000. There was an option to pay in full on June 30, 1923, or 40 per cent on June 30, 1923, 20 per cent on September 29, 1923, December 31, 1923 and March 31, 1924.

2076 Under order 15142, dated June 13, 1925, $10,000,000, payable 50 per cent on the 29th of July, 1925, and 25 per cent on September 30, 1925, and 25 per cent on December 31, 1925.

Under Commission's order No. 16814, dated November 30, 1926, $30,000,000 payable, 50 per cent on January 15, 1927, and 25 per cent on June 30, 1927, and 25 per cent on September 30, 1927; and finally under Commission's order 18720, dated November 20, 1928, $40,000,000, payable 50 per cent on the 1st of July, 1929, 25 per cent on the 1st of January, 1930, and 25 per cent on the 1st of July, 1930. That is financing in advance.

The American Telephone and Telegraph Company has taken its pro rata proportion of the stock sold under these orders as stated and I may state further, that all the issues except that in 1916, which covered expenditures to be made in 1916, and 1917, were to reimburse the Treasury for expenditures made within five years next preceding that of the application, not from the proceeds of approved capital stock and bond issues.

2077 All of these issues which I have mentioned here were made at par. The American Company paid par in every instance. It purchased at par, and perhaps in some cases in excess of par, all stock not taken by stockholders.

2078 In every instance, we conform to the requirements of the law.

2079 K. E. THOLIN further testified as follows:

Direct Examination (Continued) by Mr. Clausen.

I have made a study of the plaintiff's books pertaining to interest during construction.

2081 I have determined that the investment in gross additions as indicated by the said books for the nine year period from January 1, 1920, to December 31, 1928, exclusive of interest and general equipment, amounted to $144,794,718.

I have also determined from the said books that during this nine year period the plaintiff charged to its fixed capital account for interest during construction, the total sum of $1,399,130.

A comparison of said interest during construction as related to the foregoing gross additions is a trifle less than 1 per cent from my examination of the books of the plaintiff.

I have found that these books show that the Chicago
2082 Telephone Company, now the Illinois Bell Telephone Company, started operations in the year 1881; that at the close of the year 1881, it had invested in plants and equipment within the City of Chicago a total sum of approximately $500,000, and that the number of stations served at the end of the year 1882 were, 2,610.

The property of the plaintiff has grown gradually year by year, until as of June 30, 1923, the books show an investment in plant and equipment of $95,626,014, and the number of telephone stations, 657,435, and during this entire period the Company has been in operation and has been earning income sufficient to pay dividends ranging from 24 to 41 per cent in the first ten years and from 8 to 20 per cent in the remainder of the period.

I have made a study of the company's books and records showing maintenance cost and for charges made against depreciation reserve, representing losses due to retirement of property.

2083 (Commission's Exhibit 11 marked for identification). The first column of this exhibit shows investment in

plant and equipment as shown by the Company's books at December 31, of each year.

The second column shows the total maintenance expense, exclusive of depreciation account No. 608, as shown by the Company's books for each year.

The third column indicates the percentage relation which the second column bears to the first column.

The fourth column contains the net charges which the Company has made to its depreciation reserve during each of these years.

The fifth column indicates the relationship of column 4 to column 1.

The sixth column is a total of columns 2 and 4, being the total maintenance and charges to depreciation reserve.

The seventh column indicates the relationship of the
2084 sixth column to plant and equipment shown in the first column.

The latest data of this kind which was available to the Illinois Commerce Commission at the time of writing its order, was for the year 1922. The average figures for the twelve years, 1911 to 1922, indicated that the company had spent on an average 5.41 per cent of its plant account, annually for maintenance, and that it had actually used from its depreciation reserve an annual average of 1.62 per cent of its property account, or that the company's total average requirements for actual losses realized on account of property retired together with its annual maintenance expense amounted to 7.03 per cent of its plant equipment account.

I have prepared a statement of maintenance and depreciation of station apparatus.

(Commission's Exhibit 12, marked for identification).

2086 I have read the accounting instructions issued by the Company which were in effect during the year 1922.

2087 The 1922 instructions filed by the Company with the Commission have been misplaced. The portion that I have in mind has been used in the affidavits filed heretofore in this case.

The instructions under this sub-account were as follows:

1. "Report under 18R, cost of keeping this class of
2088 plant in good working condition, incurred either at premises of subscribers or in repair shops. This includes the cost of complete sets or component parts used in replacements for maintenance reasons as well as the cost of minor parts used in repairing station apparatus.

Note A. Routine replacements of apparatus at subscribers' premises or 'vacant premises' stations destroyed by storms, floods, fires, or other casualties should be reported under Code 18R. This includes the necessary replacing of apparatus as well as all other costs of doing the work. When such replacements are done under a Specific Estimate, the accounting should be as authorized by the estimate.

Note B. Replacements of apparatus stolen from subscribers' premises or from 'vacant premises' stations should be charged to 18R.

2. Report under 18R salvage recovered from such work."

In regard to the upkeep of station apparatus I have found that losses resulting from fire are being provided for in the company's operating expenses in three different ways.

First, such losses are provided for in the depreciation
2089 charge; second, such losses are provided for by insurance which is also charged against the expense; third, such losses as actually occur are charged direct to the Repairs Account when they do occur.

In this way the same expense is included three times in the operating expense.

The loss of station apparatus due to theft is one factor used by the plaintiff in computing its depreciation rates. The company's instructions to its employes in regard to reporting such expense, indicates that any losses due to theft which actually occur are to be charged to the operating expenses.

Losses due to the destruction of Central Office Equipment by fire has also been duplicated in the company's expenses in that the depreciation charge has been stated to cover losses

due to fire and water, and it is also insured against such losses

In connection with my examination of the books and records of the company, I made a study of such data as the company furnished me, in response to my request therefor, in support of its depreciation rates.

2090 The Company used a method called the turnover cycle method in determining the life of its entire plant. Based on my study of this matter, I have an opinion as to the accuracy or lack of accuracy that will result from the use of this method.

In my opinion, the estimate of life as shown by the data which the plaintiff gave me to examine did not correctly show the company's past experience of life of the property as a whole.

In the first place, the company's method includes no adjustment for the effect of the growth of the property.

In the second place, the company's data included no adjustment for the effect of increased price levels.

Both of these matters would have the effect of increasing the life as determined by the company's method.

The company's compilation of life for the entire property also includes a certain error of method, because of the inclusion of property of various life expectancy, ranging from approximately five years upward to fifty years. This error of method makes the result very uncertain.

2091 Another error was included in the company's data, in that it did not deal exclusively with property on which depreciation is computed. This also caused the company's showing of life to be too small.

I have made an examination of a formula which is considerably different from the turn-over cycle method. In the explanation which the company gave me regarding this new formula, it stated that this new method would obtain a truer picture in the trends in the average lives of the various property accounts.

I have prepared an exhibit showing the application of this new formula to the investment in Central Office Equipment.

(Commission's Exhibit 13 marked for identification.)

2092 In the explanatory data which the plaintiff submitted to me in connection with this new study of life I found the following remarks:

> "The formula used in determining average life from the operations during any one year is based upon the assumptions (1) that all plant is retired at the end of its average life, and (2) that the rate of growth will be uniform."

The first assumption, that all plant is retired at the end of its average life, is contrary to fact and contrary to the experience of the plaintiff. The very use of the word "average," in speaking of life indicates that various units have lives of different length and are not all retired after the identical period of time has elapsed. To be an average, it is ordinarily an average of items of different sizes, some shorter and some longer than the average.

The second assumption, that the rate of growth will be uniform, is also contrary to the company's experience. This was demonstrated by page 6 of Hammond's Exhibit "A" filed in the case before the Illinois Commerce Commission, wherein it was shown that the average rate of growth for the plaintiff's property in the City of Chicago, during the years 1911 and 1922, was 10.76 per cent, and that the

2093 variation has been from a low percentage rate of growth of 6.17 in the year 1919 to a high figure of 15.56 in the year 1914.

The figures for the entire company indicated similar variations in growth.

It is, therefore, apparent that the basic assumptions of the formula do not correspond with the facts as found in the history of the Chicago property of the plaintiff. For this basic reason, I believe that the formula cannot properly be applied to any figures drawn from the plaintiff's books, and that if

an attempt is made to apply the formula the resulting figures cannot be relied upon.

In order to test this formula of the plaintiff, I prepared a table of theoretical figures of gross additions and displacements of property, starting with an original investment of $100 and assuming a life of exactly three years for every unit and a rate of growth of ten per cent per annum. I carried this table of figures forward for a period of forty-six years, assuming that all property was added on January 1st of each year and that the identical amount of property was retired on January 1st, three years later.

2094 By applying the plaintiff's formula to the gross additions and displacements for the fourth year I obtained an indicated life of 1.198 although I knew, on the basis of the assumption, that the correct life was three years.

I also applied the plaintiff's formula to the figures for the fifth year, which showed an indicated life of 8.88 years, although I knew the correct life was three years.

The application of the formula to the sixth year also showed an indicated life of 8.88 years.

This process was followed for each of the years commencing with the fourth to and including the forty-sixth year, which was as far as the table was carried.

In none of these years was the indicated life, according to the formula.

The trend of these figures, supposed to represent life, indicated that if this process was carried on through a great number of years to infinity, the results might then equal the predetermined figure of life. However, in the illus-

2095 tration used, I purposely used a very short life of three years, and, therefore, I obtained not less than fifteen complete replacements or turnovers of the original unit.

(Commission's Exhibit 13-A marked for identification.)

The history of the plaintiff's property in the City of Chicago only extends over a period of between forty and fifty years. If central office equipment has a life of anywhere from ten years and upwards, there could not have been to

exceed four or five turnovers or complete replacements in the company's entire history.

Therefore, the application of this formula to data covering such a short period, even if it is assumed that the
2096 formula in the first place was properly applicable, which is not the fact, cannot possibly produce any figures that can be relied upon as a showing of the company's experience of life.

Under this formula of which the particular equation shown in this exhibit is only one of a series of equations, a separate computation of life is made for each year based upon the gross additions and the displacements of that particular year.

The resulting figure, shown in the last column of this exhibit, has been called life. This estimate of life as shown in the last column has varied from a low figure of 7.7 years for the year 1912 to a high figure of 47.2 years in 1920. There appears to be no natural tendency for these resulting figures to group themselves around any particular figure which might indicate a normal average life.

From this conglomeration of figures the company has produced an arithmetical average of 20.9 years. However, the company did not use this figure as representing the life of central office equipment, but, under the claim that the years 1918 to 1921 inclusive were abnormal. the company has arbitrarily excluded the results for these four years and arrived at an average of 12.6 for the remainder of the
2097 period. This estimate of 12.6 has apparently been used as the basis of the life of central office equipment used in the company's depreciation rates for the years 1924 to 1927, which was twelve years.

I have a copy of the report of the preliminary investigation of depreciation charges of telephone companies and the conclusions and recommendations of the depreciation section, for the regulation of such charges, made by the Bureau of Accounts of the Interstate Commerce Commission in case 14,700 submitted to Telephone Companies March 10, 1923. That report contains, in an appendix, a statement showing varia-

tions in the service life of the different classes of property as compiled from the returns of 933 individual telephone companies. I have prepared a statement showing in comparative form the estimates of life as shown in the appendix to that report, with the estimates of life used by the plaintiff for various periods. I have that statement with me.

2098 (Commission's Exhibit 14 marked for identification. Objection by plaintiff to reading of Exhibit on the ground that the table speaks for itself. Objection overruled.)

The table illustrates the life that the company has used in three different periods, where they have determined the life for depreciation rates. First, for the period of 1921 to 1923; then the period 1924 to 1927; then beginning with the year 1928. This is set out in a sort of comparative form showing the minimum and maximum estimates of these 933 tele-

2099 phone companies throughout the country as reported to the Interstate Commerce Commission.

In my examination of the company's books and records and the records before the Illinois Commerce Commission, I studied the matter of salvage.

A study of the company's books indicates that for the nine year period, 1913 to 1921, inclusive, the plaintiff actually realized a composite salvage of 57 per cent on the total property retired.

The detailed estimates of salvage for the various types of property which formed the basis of depreciation rates used in the years 1921 to 1923, inclusive, when composited, result in an estimate of salvage of approximately 35 per cent for the property as a whole.

I made a study of the annual loss of value or annual depreciation based upon the testimony of plaintiff's witness Rhodes in the present proceeding.

2100 Plaintiff's witness Rhodes testified that the property of the plaintiff, exclusive of general equipment, was in at least 90% condition as of June 30, 1923.

(Motion by plaintiff to strike answer on ground that wit-

ness is not competent to testify on the subject. Motion denied.)

2101 Taking the difference between 90 per cent and 100 per cent, I have made a computation.

The plaintiff's witness Sloan, in the present proceeding, testified that the present property was composed of the gross additions for somewhat more than the past fourteen years.

Based upon this theory, which is the same theory as the turnover-cycle theory I have used elsewhere that the plant now in service consists of the most recent gross additions, I have made a computation dealing with the depreciable plant in the same manner as was done by both the plaintiff's and the Commission's witnesses in case 11894, and, therefore, I have computed the average age of the plant in service at June 30, 1923, as 5.79 years.

Based upon the figures of fourteen years, testified to by Mr. Sloan, it is my opinion that the average age of the
2102 property is, in fact, greater than 5.79 years.

After taking this minimum figure of expired life, or age of the property, of 5.79 years, and dividing it into the total loss, the total of ten per cent—the difference between the 90 per cent and the 100 per cent—I have computed the approximate average annual loss of value as 1.75 per cent.

A study of the charges to depreciation reserve representing the net realized loss on property actually retired during the fifteen years, 1911 to 1925, indicates that the loss has averaged approximately 1.63 per cent of the plant account.

I have prepared from the company's books and records a comparative table of annual depreciation and amortization rates which have formed the basis for the company's charges to operating expenses from January 1, 1913 to and including the year 1928.

2103 (Commission's Exhibit 15, admitted in evidence.)

I have prepared from the company's books and records a statement of the company's revenues, expenses and

net income available for a return, for the years 1922 and 1923.

(Commission's Exhibit 16 marked for identification.

2104 Mr. Bangs moves to strike from exhibit the words "Rate Base." Motion denied.)

The first two columns of figures in this exhibit represent the revenue expenses and net income available for re-

2105 turn for the years 1922 and 1923 as shown by the company's books. The last two columns contain corresponding figures for the years 1922 and 1923, with certain adjustments which I would like to explain.

In preparing this income account for the years 1922 and 1923, I have made all calculations with the assumption that the Commission's order of August 16, 1923, was actually effective on January 1, 1922.

This will furnish a proper test of the results of the Commission's order.

Referring to column 3, which is the adjusted income account for the year 1922, and comparing the same with column 1, in which are the actual figures as shown by the company's books, I wish to point out adjustments.

I have made no change in any of the items 1 to 6, inclusive. Item 7, which represents the payments to the American Telephone & Telegraph Company under the 4½ per cent contract has been changed so as to conform with the order of the Illinois Commerce Commission, and the order of the Public Utilities Commission, which orders allowed an expense of $2.10 per station.

The next item which contains an adjustment is number 9, Maintenance and Depreciation, which has been computed on the basis of the Commission's order. The Commission

2106 allowed for Maintenance and Depreciation a sum of $7,869,400 in respect of the property in use at December 31, 1922. This was at the ratio of 9.18 per cent. Therefore, I have applied the ratio of 9.18 to the average investment in plant during the year 1922, and thus arrived at the figure

of $7,456,630. That is the only adjustment which I have made in the operating expenses.

Subtracting the total deductions on Line 15 from the total income of Line 8, gives us on Line 16 the amount available for return of $8,101,561.

Line 17 contains another adjustment representing an additional amount which should be included as return. This item represents the benefits to the stockholder by reason of his exemption from Federal Income taxes on his share of the earnings of the corporation.

(Motion of Plaintiff to Strike out line 17 as based on an erroneous assumption. Motion denied.)

2107 The figure, of $576,397.00 shown on the 17th line in
2108 the third column, has been computed as follows:

The company accrued and charged against income in the year 1922 the sum of $672,184.00 for Federal income taxes. The tax rate in that year was 12½ per cent. The net income on which the company pays its income tax is substantially the same as the net income which is available for distribution to the stockholders, with the exception that the income tax itself must be paid. If the entire net income, without deduction of the tax itself, were payable to the stockholders, the benefit by reason of exemption from tax to the recipient of this income, in the case of a corporation, would be identical with the amount of tax paid by plaintiff.

For instance, on every $100.00 earned by the plaintiff, it would be subject to $12.50 tax, while if this entire $100.00 were distributed to the A. T. & T., it would be relieved from paying $12.50 of tax on this $100.00.

However, in this illustration the plaintiff would have to pay to the government $12.50 out of the $100.00, and thus could only pay to the stockholders $87.50.

Thus, since the distributable net income is 12½ per cent less than the net income earned before payment of income tax, it would likewise be true that the benefits accruing to the

A. T. & T., by reason of exemption from income tax on
2109 this net income, would also be 12½ per cent less than
the income tax paid by the plaintiff.

Therefore, I have deducted from the tax accrual of $672,184.00, 12½ per cent thereof and thus arrived at a figure of $588,161.00. Now, since the A. T. & T. owns at least 98 per cent of the stock of the plaintiff, I have taken 98 per cent of this last figure as representing the benefits by reason of exemption from paying income tax on its share of the distributable net earnings of the plaintiff.

In this matter I have not dealt with the actual dividends paid, for the reason that a corporation might in some year pay greater dividends than were actually earned, thereby drawing on past profits, or in another case, the company may not pay any dividends although it had sufficient earnings.

Adding the amount of this adjustment, as shown in the third column, I have arrived, as shown on Line 18, at the total amount available for return based on the rates for service actually charged by the plaintiff.

From this sum I have deducted, on Line 19, an amount of $1,700,000, representing the company's estimate of loss in revenue based on the rates fixed by the Illinois Commerce Commission in its order in case 11894.

Plaintiff's Exhibit 4 shows that it has deducted, in arriving
at net income under the rates prescribed by the Com-
2110 mission for the year 1924, an amount of $1,719,624, as
representing the amount reserved for refunds.

In each year thereafter the plaintiff deducted larger amounts. It would therefore appear that an adjustment for the year 1922, which is two years earlier, and at which date the plaintiff had fewer subscribers, that the sum of $1,700,000 is possibly somewhat too great.

The 20th line shows that the balance available for return for the year 1922, as shown by the adjusted figures in the 3rd column, is $6,977,958.

On the following line I have shown the rate base, which I have already described in the early part of my testimony.

The next line indicates the rate of return before including the benefit from exemption from Federal Income tax and revision of rates. This rate of return is 8.66 per cent.

The net line indicates the rate of return after including the adjustment for benefit by reason of exemption from income tax, and shows that under the present rates the company earned 9.27 per cent on the above rate base.

The last line indicates that the rate of return, after making all adjustments, including the adjustment for refunds,
2111 as estimated by the plaintiff, would be 7.46 per cent.

The figures in the 4th column have been prepared in a similar manner as I have described for the year 1922. This shows that the net income of the plaintiff for the year 1923, when adjusted to conform with the rates for service, and other findings made in the Commission's order, would have resulted in 7.10 per cent on the fair rate base.

I have not made any adjustment in the expenses included in my exhibit for any taxes which have been paid on property under construction and charged against expenses rather than the plant accounts, because the amount that is included in the plant account would be very difficult to segregate and I have not segregated that amount. The same is true in connection with the insurance during construction. I have made no adjustment for that. I have made no reduction in these operating expenses to offset the claim on the part of the plaintiff that cost of training operators constitutes a
2112 value to be included in the rate base, although such cost has been charged to operating expenses. I have made no adjustments for similar claims on the part of the plaintiff in connection with issuing directories. I have no reduction in expenses on account of costs of training, maintenance, commercial, traffic, accounting and engineering employees which the plaintiff has indicated should be considered in its fair value. I have not made any adjustment so as to eliminate any cost of advertising for the purpose of securing subscribers. I have made no reduction in these expenses for the cost of developing forms and records. I have made no reduc-

tion under these expenses on account of expenses in excess of normal during the period of construction and development.

2113 Property is being continually added to the property of the Illinois Bell Telephone Company.

Commission's Exhibit 1 shows that during the years 1922 to 1925 inclusive, the company's gross additions amount to more than $64,000,000 which is over half of the investment at the end of the year 1922.

I have prepared a statement of the company's revenues, expenses and net income for the years 1924 and 1925.

(Commission's Exhibit 17 marked for Identification.) This exhibit was prepared by the same method as was used in Exhibit 16 with one exception, as follows:

Since the Commission's order would have been in effect beginning October 1, 1923, I have in this statement made figures on the assumption that the Commission's order
2114 had actually gone into effect on that date. The net income, as shown in the 3rd column, which is for the year 1924, is $7,785,399. This represents a return of 7.15 per cent on the rate base as shown. The last column shows that the rate of return for the year 1925 would have been 6.84 per cent.

I have prepared a statement showing what the net income as determined by me would be upon the original cost of the property as shown by the company's books.

(Commission's Exhibit 18 marked for identification.)

The first line of Exhibit 18 shows the original cost of average plant in service during the year, as shown by the company's books.

The second line shows the average construction work in progress during the year, as shown by the company's books, adjusted on the same basis as explained in connection with the rate base computations.

To these amounts I have added the Commission's findings

for omitted overheads, and the Commission's findings
2115 for working capital, making a total original cost, undepreciated, for the year 1922, of $93, 344,777.

I have deducted from this amount the accrued depreciation, which is the same figure I have previously explained in connection with the rate base computation.

This leaves the original cost, as shown by the company's books, less accrued depreciation, which for the year 1922 was $69,387,041. The adjusted net income, as shown on previous exhibits, was $6,977,958. This represents a return on the undepreciated original cost, as shown by the books, of 7.48 per cent, or a return of 10.06 per cent on the depreciated book cost. Figures for the year 1923 indicate a return on the depreciated book cost of 9.30 per cent.

I have prepared a statement showing the rate of return, upon the original cost of the property as shown by the company's books for the years 1924 and 1925.

(Commission's Exhibit 19 marked for identification.)

2116 This statement was compiled in a similar manner to the one for the two previous years that I have already explained. It shows that the rate of return based on adjusted net income for the year 1924 was 9.19 per cent of the depreciated book cost. The corresponding figure for the year 1925 was 8.56 per cent.

I have prepared a detailed statement on operating revenues of the Illinois Bell Telephone Company for the years 1922 to 1925.

(Commission's Exhibit 20 marked for identification.)

This is a copy of the detailed operating revenue accounts taken from the company's books. I have prepared a similar statement of the primary accounts making up the operating expenses for the years 1922 to 1925 inclusive.

2117 (Commission's Exhibit 21 marked for identification.)

This statement is simply a tabulation of the operating expense accounts for those years as shown by the company's books. The total operating expense is shown on the second page.

I have prepared a statement showing the number of telephone stations in service at the end of each of the years 1922 to 1925 inclusive.

(Commission's Exhibit 22 marked for identification.)

It is simply a detailed tabulation of the number of telephones in service in the City of Chicago classified according to certain main groupings. The last line shows the average number of stations in service during each year. The figures were taken from the company's books and records.

2118 I have examined a certain publication entitled "Survey of Current Business" prepared by the Bureau of Census in co-operation with the Bureau of Foreign and Domestic Commerce, and the Bureau of Standards and issued monthly. I examined the issue for February, 1929, which is No. 90. I made a photostatic copy of page 127 of this pamphlet.

(Commission's Exhibit 23 marked for identification.)

This exhibit 23, which is labeled "Table 10 Public Finances, Interest Rates and Bond Yields," contains certain financial statistics which have been compiled by the United States Department of Commerce.

2119 I desire especially to direct attention to the right hand portion of this exhibit which is entitled "Bond Yields."

In the next to the last column we find the monthly average yields for fifteen high grade utility bonds.

It will be noted in the upper portion of this statement that the average yield of the fifteen utility bonds was gradually increasing during the years 1913 to 1920, inclusive, reaching a peak of 6.73 per cent in the year 1920.

It also will be noticed that there was a very material reduction since 1920, the monthly average for the year 1923 being 5.41 per cent, which has since been still further lowered.

(The only portion of page in question admitted is particular column dealing with 15 utility bonds which is next to last column on page, together with footnote No. 3.)

(Commission's Exhibit 24, marked for identification).
2120 Exhibit 24 is copy of page 129 from same document.

I desire to call attention especially to the last column entitled "Yields of Industrials." This shows the yields on industrial common and high-grade preferred stocks for the period of 1923 to 1928 inclusive. I have prepared a balance sheet of the Illinois Bell Telephone Company as of December 31, 1922.

(Commission's Exhibit 25, marked for identification).

These figures were taken from the books of the Illinois Bell Telephone Company and is a true and correct statement.

2121 The books of the company do not show the capital obligations pertaining to the City of Chicago separately. However, I have determined that as of December 31, 1922, the total capital obligations of stock and bonds amounting to $94,884,179 represented 71.44 per cent of the investment in fixed capital including work in progress of the entire company amounting to $132,819,764. The investment in fixed capital and work in progress in the City of Chicago at the same date amounted to $91,707,251.

By applying the same ratio of 71.44 per cent to this investment, I have determined that the capital obligations pertaining to the Chicago property would amount to $65,515,660.

I have divided this sum as between capital stock and funded debt on the ratio of these types of obligations actually outstanding. This ratio was 63.23 per cent stock and 36.77 per cent bonds. Thus the capital stock outstanding for the City of Chicago would amount to $41,425,552, and the bonds would amount to $24,090,108.

By applying an 8 per cent dividend rate to the $41,425,552 of capital stock, I have arrived at an annual dividend
2122 requirement of $3,314,044.

By applying the company's actual cost of securing funds by the issue of bonds, which was testified to as being 5.53 per cent on the bonds outstanding pertaining to the City

of Chicago in the amount of $24,090,108, I have arrived at the total annual interest requirement of $1,332,183.

The total of these annual dividend and interest requirements for the City of Chicago amounts to $4,646,227.

An annual return of 4.84 per cent on $96,000,000 would produce this sum.

2123 I have made an investigation of the cost of maintaining and operating manual Central Office Equipment as compared with machine switching Central Office Equipment.

(Commission's Exhibit 26, marked for identification).

The first line on this exhibit shows the average number of stations served by the manual and by the dial equipment of central offices. I have shown information here for the years 1924 to 1928.

The next group represents charges, as shown on the company's books, for repair of central office equipment of the two different types of equipment.

2124 Below that I have shown the repairs per station for the various types.

Next I have shown the depreciation charges for each of these types of equipment, with a computation of depreciation per company station.

Below that I have shown the charges for clerical operating wages and operating wages for the two different types of equipment, with the unit cost per station.

And below I have totaled the unit cost per station for each of the years, comparing the two types of equipment.

2125 This work order covers the installation of automatic listening straight forward trunking equipment in 28 residence central offices in Chicago, with the necessary associated outgoing trunk equipment in the loop offices. This estimate also covers the removal of all circuit keys and associated equipment from the subscriber's switchboards in these offices.

The installation of this new equipment was done principally in the year 1926, the total cost being approximately two and a half million dollars.

The estimates of original cost of property to be retired was $587,932. Of this amount $5,498 was removed from plant accounts in the year 1926, and $66,294 was removed in June, 1927. $74,746 was removed from the plant accounts in October, 1927, and $112,268 was removed from the books in November, 1927. This makes a total of $258,806 of original cost that has been removed from the plant accounts out of the estimated amount of $587,932.

On the engineer's final report in connection with this work order or estimate, I have found the following reference to the remaining portion of estimated retirements not made on the books, amounting to $329,126. This explanation is
2126 as follows:

The circuit keys although no longer required have been left in place as the cost of removal would exceed the salvage and there is a possibility that they can be used for other purposes.

2127 (Commission's Exhibit 27, marked for identification).

Order of the Interstate Commerce Commission in Case 14,700 relating to Depreciation Charges of Telephone Companies and in Case 15,100 Depreciation charges of steam railroad companies, decided November 2, 1926, together with all amendments and subsequent orders relating thereto, admitted in evidence

Mr. Bangs files with said orders the petition for re-hearing of Bell Telephone System Companies and the independent telephone association; brief of the Special Committee on telephone depreciation of the National Association of Rail-
2128 way and Electric Utility Commissioners; brief of the
to to U. S. Independent Telephone Associations on appli-
2131 cation for rehearing and the orders of the Interstate Commerce Commission on the rehearing.

(Commission's Exhibit Nos. 1 to 27 inclusive, except No. 10 withdrawn, admitted in evidence, subject to subsequent ruling on admissibility).

Cross-Examination by Mr. Bangs.

I testified before the Illinois Commerce Commission in the proceedings under review. So did Mr. Hammond. I think I prepared most of the exhibits. Mr. Hammond and I are the only persons who testified before the Commission on behalf of the Commission.

2132 The Commission has an engineering department and a chief engineer. I cannot recall that any member of the engineering department testified in Case 11,894. We have had various jobs in connection with your books since 1921. Some of our men are investigating there now. We have been continuously examining books of the plaintiff since 1921 in some case or other. I think there are about five or six men there right now and at times we might have had a few more than that and at other times we probably had only one or two there. It might be that the number would average around three.

2133 Frank L. Smith was Chairman of the Commission in 1921. He was candidate for U. S. Senator. I could not answer whether Frank L. Smith dominated the Commission. I don't know that.

(Objection to such cross-examination sustained).

2134 I have in a general way participated in the work of the Commission. That does not mean that I have attended every conference but I have attended conferences where I have had some special interest and was called in. I am not acquainted with what the Engineering Department has done in the cases decided by the Commission involving telephone cases from June 30, 1923 to April 1, 1929.

2135 I have testified in some of those cases or some of our men have testified to the accounting reports. I cannot say that I have ever testified in connection with the Illinois Bell or any other company in the state as to the depreciation rates that ought to be applied.

2136 Our accountants in all cases make a report of what the depreciation reserve and the depreciation accounting

on the company's books have resulted in, showing what the debits are and the credits are to the reserve and how much is charged in expense; that is a part of our regular accounting report and that has been done in all cases. I do not read all of the orders of the Illinois Commerce Commission as they come out. I have read some; those that I have had time to read.

(Mr. Bangs hands witness list of cases decided by Illinois Commerce Commission as to the independent telephone companies between June 30, 1923 and April 1, 1929 showing depreciation rate in each case and composite rate.)

2137 I don't know what the Commission's engineers did in these cases but I would like to look at it to find out what they testified to. I would have to look up the record before the Commission to find out what they testified to in each case.

2138 Well, I haven't any recollection of these particular depreciation rates.

There is a great mass of detail. For instance, the first one says here allowance. It doesn't use the word allowance, but simply says 33,213. Whether that is a number or a number of dollars, it doesn't show. It is simply a number 33,213 plus 5¼ per cent on all net additions to local and toll property after October 1, 1928.

2139 (City Exhibit 125, Certified Copy of Order of Appellate Court of Illinois dismissing appeal and reversing the order in *Read* v. *Central Union Telephone Co., et al,* admitted in evidence. Objection by plaintiff; objection overruled subject to subsequent motion to strike.)

(City Exhibit 126, List of Directors of Illinois Bell Telephone Company as of December 31, for the years 1884 to 1925, admitted in evidence).

2140 (City Exhibit 127, showing stock of Illinois Bell Telephone Company held by various directors during the years 1911 to 1925 inclusive, one column showing where stock was owned personally by director; the other column showing

stock equitably owned by A. T. & T. Co. and placed in name of the diector, admitted.)

2145 (Witness continues):

I do not know in each case who testified or what they testified to. (Objection by Commision to testimony as to contents of Commission's Order.

2146 Objection sustained.

2147 (Plaintiff's Exhibits 47-A, 47-B, 47-C, 47-D and 47-E, certified copies of orders of Illinois Commerce Commission, admitted in evidence).

I have never operated a telephone property. I have made some studies as to the life of component parts of telephone property along the lines of the studies that I have testified to here, from the accounts of the company. I have not testified as to the average life of the component units of telephone properties.

2148 Commissions Exhibit 9 is an illustration of the $10,000 unit. In the 11th column at the end of the 9th year, I have built up a total plant and equipment of $19,000. That is the book cost of property that is used in service. Under the illustration that would be in service for the company's subscribers at the end of the 9th year. The first unit would go out of service on the first day of January of next year. Then we would have only $10,000 worth of property to serve the subscribers.

(Plaintiff's Exhibit 48, marked for identification).

2149 I have not examined this exhibit closely enough but the main difference between this and my exhibit is that you are dealing here with a growing plant which would be composed of a multitude of units. I presume each of the units would be similar to the one unit that I dealt with for the sake of simplicity. I have not examined Exhibit 48 closely enough to say whether it would more closely compare with the actual operations of the Illinois Bell in Chicago. Plaintiff's plant

in Chicago is a growing plant. Additional property is put in from time to time.

2150 My Exhibit No. 9 does not assume a stable plant. Mine is simply an illustration of one unit of plant whether growing or not and the same picture would be true for any unit as is shown in my Exhibit No. 9. It is just a matter of how many of them you want to put in the picture. Plaintiff's Exhibit 48 looks as if it takes an additional number of units of the same character and shows a growing plant. Your heading indicates that is the fact. If the heading and the facts underneath the heading are in accordance with the heading then your statement is correct in that it shows a number of units and a growing plant but I would want to check up on that a little.

2151 In the third column of figures, 25th year, it shows $26,105 worth of plant retired. The corresponding figure to represent the placing of the portion of the plant which was retired in the 25th year is in the second column. In this exhibit, it is in the 15th year, that is, ten years earlier. That is the basis of the assumptions made through the entire table. The percentage of $26,105 to the plant at the beginning of the 25th year would be the percentage of $26,105 to $417,726.

2152 If we assume that this property grew twice as rapidly, the percentage would not be $26,105 to an amount of property in excess of $417,000. The $26,105 would be a different figure and it would change the entire comparison here if you put in a different set of assumptions. I could not say without some study whether that would be a greater or less percentage. In a theoretical illustration worked out to a nicety like this, the retirements in one year in any growing property would be equal on the average to the plants installed in the previous years, depending upon the life of the property but in actual practice the figures of retirement would vary according to the needs of the company.

2153 There are many things that enter into retirement. It is largely a matter of the financial policy and the oper-

ating policy of the company as to when it makes its retirements. As a matter of fact, one company may use a switchboard for ten years and another for five years. I don't believe I testified to anything being abnormal as to the retirements during the war years from 1918 to 1922 as shown in Commission's Exhibit 12.

2154 I have not attempted to make an explanation of the small amount of retirements of the Illinois Bell from 1918 to 1921. I have simply shown what the company's books show. I cannot state of my own knowledge why these figures of the retirements are small in certain years.

2155 If you enter upon some construction program that also involves some retirement of property and if that construction program is small compared with a similar construction program in other years, I presume the retirements would also vary in like amounts. I don't know whether or not this would explain the small amount of retirements in the case of station apparatus during the war period as shown in Commission's Exhibit 12.

2156 As to Commission's Exhibit 11, it may be correct that the retirements during the war period were less then because of a smaller amount of additions. I presume the old property was allowed to stay there and it was used as it was without replacing it, but I have not been out and inspected the property. I cannot speak of it from that point of view but that might be my guess from the figures shown here. Commission's Exhibit 9, purports to represent the experience that the company has regularly had with one unit of plant. I think in a general way that Plaintiff's Exhibit 48 would represent the experience of the company with reference to a number of units of plant in a growing plant. In actual practice, the retirements of property would not fluctuate as violently as they appear to on an illustration of this kind.

2798 City's Exhibits 132 and 133 admitted in evidence.

2799 City's Exhibit 134 admitted subject to subsequent motion to strike.

City's Exhibits 135, 136, 137 and 138 admitted in evidence.

2800 City's Exhibits 139, 140, 141, 142 and 142A admitted in evidence.

2801 City's Exhibits 142B, 142C, 142D, 142E, 142F, 142G admitted in evidence.

2802 It is stipulated that the original authorized capital stock of the Chicago Telephone Company was $500,000.00. It was legally increased January 23, 1883, to $2,000,000.00; on January 23, 1892, to $5,000,000.00; on February 1, 1900, to $15,000,000.00; on February 24, 1904, to $20,000,000.00; on February 17, 1908, to $30,000,000.00; on April 26, 1917, to $40,000,000.00; on June 15, 1921, to $50,000,000.00; on March 24, 1922, to $60,000,000.00; on April 10, 1923, to $70,000,000.00; on May 22, 1925, to $80,000,000.00; also that the Board of Directors was legally increased from 9 to 11 on February 23, 1898, and which number is still the number of directors of the Chicago Telephone Company.

It is stipulated further that the name of the Chicago Telephone Company was legally changed on December 23, 1920, to Illinois Bell Telephone Company; that the American Bell Telephone Company was incorporated under the laws of Massachusetts on April 17, 1880, for the purpose of manufacturing, owning, selling using and licensing others to use, electric speaking telephones and other apparatus and appliances pertaining to the transmission of intelligence
2803 by electricity, and for the purpose of constructing and maintaining by itself and its licensees, public and private lines and district exchanges. That on December 16, 1921, the American Bell Telephone Company was dissolved; that the American Telephone & Telegraph Company legally qualified as a foreign corporation in Illinois on January 13, 1899, and has been ever since so qualified and doing business in Illinois.

It is stipulated that with reference to City's Exhibit 92, such order was in full force and effect from April 17, 1918, to February 1, 1919, and had not been abrogated or modified during such period.

(Above stipulation as to Exhibit 92 admitted as to facts

and objected to by plaintiff as to materiality and admitted subject to motion to strike.)

It is stipulated further that the rates of dividend paid by the Chicago Telephone Company are as follows:

1882	32 %
1883	40 %
1884	48 %
1885	46 %
1886	47 %
1887	51 %
1888	39 %
1889	30½%
2804 1890	30 %
1891	24 %
1892	20 %
1893 to 1901	12 %
1902 to October, 1908	10 %
1908 to date	8 %

Also that the Chicago Telephone Company was incorporated under the laws of the State of Illinois on July 16, 1880, for the following purposes: To manufacture telephones and all apparatus connected therewith, and to construct, acquire by lease or otherwise, own and operate telephones and telephone and telegraph lines and offices, and to lease the same and to do a telephone, telegraph, and district telegraph business.

City's Exhibit 143 being the total telephones and telephones per 100 population in the city of Chicago from 1880 to 1928; the part up to 1925 offered by the city and the part from 1925 to 1928 offered by the plaintiff over the objection of the city, admitted in evidence.

City's Exhibit 144 offered and objected to by plaintiff.

2894 FRANK REDMUND, recalled as a witness on behalf of the intervenor, testified:

Direct Examination by Mr. Haight.

I have looked over the map that has been marked for identification as City's Exhibit No. 145. The red lines on this map show the circuits of the American Telephone and Telegraph Company as they were at this time. I am not sure of the date but I think it was 1923. I don't know as of what date that showing is made on the exhibit, but I understood it was 1923 or just before that.

(Mr. Bangs states that was an exhibit before the Illinois Commerce Commission and that the records of the Commission show it was 1921.) I think the map shows substantially the condition in respect to those lines as it was in June, 1923.

(City's Exhibit No. 145 admitted.)

Cross-Examination by Mr. Bangs.

In 1925 the toll business between points in the old territory of the Chicago Telephone Company, principally Chicago and surrounding points, and the territory in that part of the state which was formerly operated under the Central Union Telephone Company, was taken over by the Illinois Bell Telephone Company. I am quite sure that I remember reports being made to the Illinois Commerce Commission. I never saw them but I remember the various preparations of the various papers.

2899 (City's Exhibits 128-A, B, C, D, E, F, G, H, I and J admitted.)

2902 By stipulation the following exhibits were admitted:

2903 City's Exhibit No. 146, certified copy of resolution of Board of Directors of Illinois Bell, dated May 4, 1904.

City's Exhibit No. 147, resolution of Board of Directors, November 6, 1924.

City's Exhibit No. 148, American Telephone and Telegraph

Company's cost of capital funds procured by it through sale of stocks, bonds and other borrowings.

City's Exhibit No. 149, authority sheet No. 20,020 of Illinois Bell Telephone Company.

City's Exhibit No. 150, final completion report of estimate No. 20,020.

It is stipulated that there is no objection to the offering in evidence of City's Exhibit No. 132, City's Exhibits 142-B, 142-C, 142-D and 142-G.

City's Exhibit No. 151, number of employees of Illinois Bell Telephone Company subscribing for stock.

2904 City's Exhibit 152, cover page Chicago Telephone Directory November, 1925.

City's Exhibit 152-A, page 12 of same directory.

City's Exhibit No. 152-B, page 13 of same directory.

City's Exhibit No. 152-C, page 1319 of same directory.

City's Exhibit No. 152-D, page 1320 of same directory.

City's Exhibit No. 152-E, page 1371 of telephone directory of June, 1926.

City's Exhibit No. 152-F, page 1372 of telephone directory of June, 1926.

City's Exhibit No. 152-G, page 352 of Chicago Suburban telephone directory of June, 1925.

City's Exhibit No. 152-H, page 353 of above directory.

City's Exhibit No. 152-I, page 459 of Chicago Suburban Telephone directory, 1928.

City's Exhibit No. 152-J, page 460 of above directory.

It is stipulated that in connection with all of the directory sheets shown in City's Exhibits 152 to 152-J, inclusive, the entire expense of publication was paid by the Illinois Bell Telephone Co. and no payments were made by the American Telephone & Telegraph Co. to the Illinois Bell Telephone Co. for the publication of those advertisements—that the advertisements were the advertisements of the Illinois Bell Telephone Co.—that the space where the advertisements appear

in Exhibits 152-C, 152-D, 152-E, 152-F, 152-G (insofar as the advertisement part is contained therein), 152-H, 152-I and 152-J are what is known as filler sheets, and the Illinois Bell Telephone Company would have had to eliminate such sheets if they had not contained some printed matter, and that the elimination of such sheets would have been at an expense to the Illinois Bell Company in excess of what the printed advertisement did cost.

It is stipulated that the local completed messages in
2905 the year 1923, for the Chicago Division of the Illinois Bell Telephone Co. were 761,870,392. That during the same year the completed toll calls other than long distance calls were 11,541,680, and that in the same year the total completed long distance calls were 1,905,285.

It is further stipulated that City's Exhibit No. 141 is traffic circular 173 referred to by Mr. Sloan in his testimony.

It is further stipulated that subject to the motion of plaintiff to strike the files the following facts are admitted in the record.

That a temporary injunction was entered November 20, 1913, in the case of Read v. Central Union, which order is substantially as follows:

The court finds danger of irreparable damage, etc.
2906 Defendants restrained and enjoined from paying or permitting to be paid to the American Company or the Chicago Company or to any corporation, firm or individual claiming under either of said companies, or acting on their behalf, any sums whatsoever on account of the principle or interest of the present alleged indebtedness of said Union Company to said American Company or to said Chicago Company, or either of them, or on account of any interest hereafter accruing * * * and it is further ordered that the injunction heretofore granted on the 8th day of February, 1913, be amended so as to permit the Chicago Company to transfer to the American Company the $10,300,000 demand notes of the Union Company heretofore issued by the Union Company to the American Company. (The above testimony

with reference to order in case of Read v. Central Union stricken by the court. P. 3012 of Trans.)

It is further stipulated that the following amendments and changes in the Western Electric contract with the Illinois Bell Telephone Company occurred subsequent to the execution of the original Western Electric contract in 1904, City Exhibit 55. As of November 25, 1904, the said contract was amended to provide that the same could be terminated upon three months' notice in writing from either party to the other provided that, in case of such notice by the Telephone Company, that Company shall indemnify the Western Electric Company for any loss for a period of one year from the
2907 beginning of such notice upon any premises rented specifically for the Telephone Company, and shall liquidate the obligations provided in the contract as to stocks of material and apparatus.

That in 1910 there was entered into between the Chicago Telephone Company, Bell Telephone Company and the Western Electric Company a contract which is offered without objection as City Exhibit 153. (City Exhibit 153 admitted in evidence.)

That on January 14, 1913, there was a new contract entered into between the Illinois Bell and the Western Electric Company, which is offered without objection as City Exhibit 154. (City Exhibit 154 admitted in evidence.)

That on October 13, 1920, there was written to Bernard E. Sunny, president of the Chicago Telephone Company, a letter signed by the Central District Manager of the Western Electric Company, accepted by the Chicago Telephone Company by W. R. Abbott, which is offered in evidence without objection as City Exhibit 155. (City Exhibit 155 admitted in evidence.)

Then there is offered without objection the contract of October 8, 1920, between the Chicago Telephone Company and the Western Electric Company as City Exhibit 156. (City Exhibit 156 admitted in evidence.)

2922 EVIDENCE OF DEFENDANTS IN SUR-REBUTTAL.

K. E. THOLIN, recalled as a witness for defendants, testified as follows:

Direct Examination by Mr. Clausen.

I testified herein previously on behalf of the Illinois Commerce Commission. I made up a statement with reference to the maintenance and depreciation expenses and gross additions and retirements of fixed capital for the twelve months ending December 31, 1923, from the company's books for the Chicago Division.

2923 (Commission's Exhibit 35 introduced in evidence as part of principal case of defendants.)

I have made a computation of the summaries of the depreciation reserves for the years 1911 to 1925, inclusive, with adjustments in the years 1921 to 1925, based on the public utilities commission allowance for expense of depreciation account in the amount of $2,000,000, plus 4 per cent on net additions.

2924 (Commission's Exhibit 36 admitted in evidence as part of defendant's direct case.)

(Commission's Exhibits 37, 38, 39 and 40, being the Interstate Commerce Commission's annual reports for 1911, 1916, 1919 and 1921, respectively, admitted in evidence.)

2925 G. W. CUMMINGS, recalled on behalf of defendants in sur-rebuttal.

Direct Examination by Mr. Haight.

I have examined Plaintiff's Exhibit 50, which was presented by Mr. Sloan. I have examined the working
2926 papers that underlie that exhibit. I have made a computation using the same material prices that Mr. Sloan did in Plaintiff's Exhibits No. 1 and No. 50 to determine the effect of the weighting on his index numbers.

(City's Exhibit 158 marked for identification.)

This exhibit was made by me or under my direction. It includes the same three accounts that Mr. Sloan used in his Exhibit 50. It covers the years from 1920 to 1923, inclusive, the same period covered by method No. 4 in Plaintiff's Exhibit 50. The figures shown under method No. 1 represent the gross additions from January 1, 1920, to June 30, 1923, adjusted to the June 30, 1923, cost level, as shown on pages 15, 16 and 19 of Plaintiff's Exhibit No. 1, and for that period are comparable with the figures in method No. 1 of
2927 Plaintiff's Exhibit 50. They agree, of course, with the figures in the first column of method No. 4 of Plaintiff's Exhibit 50.

Method No. 2 in City's Exhibit No. 158 for identification differs from method No. 1 in one respect only, in that it eliminates all weighting of material quantities. Where Mr. Sloan uses different quantities of different items in order that the prices may be weighted in a manner representative of the tofal plant, in method No. 2 I have eliminated all weighting and have used one of each size pole, one foot of each size cable, one loading pot, and so forth. In all other respects I have used Mr. Sloan's figures and method in computing the figures shown in method No. 2 of City's Exhibit No. 158 for identification.

Since the only difference between his figures and mine in this comparison is the difference between the weighting he used

in his appraisal and no weighting whatever, the difference between his result and mine measures the effect of the weighting on his index numbers. That effect is the difference between 100 per cent and 98.48 per cent—that is, 1.52 per cent.

2928 Method No. 3 differs from methods Nos. 1 and 2 on City's Exhibit 158 for identification as follows: In method No. 3 I have reversed or inverted Mr. Sloan's weighting by taking the reciprocals of his weighting. Since eliminating all weighting did not affect the result substantially, I wanted to know what the result would be if we went to the extreme of actually reversing the weighting. After all, this is beyond the bounds of possibility. We have illustrated that by the fact that on underground cable his largest weights are 27.7 feet of 600 pair 22 gauge cable and 37 feet of 300 pair 19 gauge, while his smallest weighting is four one-thousandths of a loading pot. Reversing these weightings by taking their reciprocals, we arrive at 3.6 feet of the 600 pair cable, 2.7 feet of 300 pair, and 25,000 loading pots.

This reversed weighting is very far beyond the bounds of possibility in any telephone plant. This wholly impossible extreme in weighting changes Mr. Sloan's index numbers only .8 per cent, the difference between 100 per cent and 99.2 per cent, as shown by method No. 3. This extreme in-

2929 sentitiveness to change is not characteristic of index numbers as I have found them in my experience. The differences in weighting in City's Exhibit 158 are far greater than in City's Exhibit No. 94. I do not reconcile the inconsequential effect of these differences in City's Exhibit 158 for identification with the very substantial effect of the much smaller differences in City's Exhibit No. 94. To reconcile them I would have to make an intensive study of the original records of the company. It would probably require about two months' time of myself and at least one or two assistants. I had no means of knowing Mr. Sloan's figures or the details of his method with respect to Plaintiff's Exhibit 50 be-

2930 fore he testified last week.

(City's Exhibit No. 158 admitted in evidence.)

2931 City's Exhibit 159 for identification was prepared to illustrate the condition under which weighting ceased to have any effect whatever on index numbers. As shown by the heading, it illustrates that if the ratio of prices on two given dates is fixed, the index is fixed, regardless of the number of units used.

(City Exhibit 159 admitted in evidence.)

2935 In City's Exhibit 161 for identification, the figures in the column headed Exhibit 68 are taken from Plaintiff's Exhibit 68. The figures in the third column headed Exhibit 50 are taken from Mr. Sloan's working papers which underlie Plaintiff's Exhibit 50.

2936 The check that I made of the quantities used by Mr. Sloan appear in City's Exhibit 161 for identification. The figures are not strictly comparable for several reasons. Exhibit 50 relates to the cable placed in Chicago, while Exhibit 68 presumably relates to all the cable purchased by the company, both in Chicago and in the rest of the state. The figures in Exhibit 68 on that assumption should, therefore, be somewhat greater than those on Exhibit 50. In addition to this, there is apt to be some overlapping at the begin-
2937 ning and end of the year. It is also probable that some of the cable included in Exhibit 50 was reused cable. For these reasons I would not expect the figures in the two exhibits to agree, but a comparison between them reveals differences which seem to me rather difficult to understand.

Looking first at the total of the 19 gauge cable, these figures show that in Chicago (that is the first group of cable in the exhibit), the company placed 51,134 feet in the next to the last column more cable, ranging from 51 pair to 455 pair, than its total purchases of these sizes for the entire state, including Chicago.

Stated in another way, if we total the figures shown by these sizes under Exhibit 50, we find that the company placed in Chicago 91,845, that is, the total 19 gauge shown in the middle column, less the 1,211 feet of 26 pair. While the corresponding total on Exhibit 68 shows only 40,711 feet pur-

chased, which is the total of the next column, also omitting the 26 pair.

So that, according to these figures the company placed in Chicago 225.6 per cent or two and one-quarter times as much as they purchased for the entire state. While re-use of
2938 old cable would probably account for some of this, and some of it may be due to an overlapping, the difference seems to me so wide, especially the difference being in that direction, it raises a serious question as to the accuracy of the figures.

Looking next at the grand total, at the bottom of the sheet, it is possible, but seems to me hardly probable, that out of over a million feet of cable purchased during the year, which was the total shown by Mr. Cox, plus whatever may have been reused (and the results obtained in the 19 gauge group indicate a large re-use, that is the only way in which the 19 gauge group can be explained is by having large re-use), the company should have placed only about one-third in Chicago and about two-thirds in the state outside of Chicago. This raises a question as to whether Mr. Sloan really found it all in his study of the annual summary. I recall in this testimony he stated he did not get his quantities from original records, but from certain annual summaries.

He stated that he had made spot checks on three sizes.
2939 Of course, this could be checked only by going back to the original records. I think these two illustrate that we might draw similar comparisons between some of the other figures, but I think that will illustrate the line of thought which this comparison indicates to me.

(City's Exhibit 161 admitted in evidence—subject to right of plaintiff to produce statements of Mr. Cox and Mr. Sloan.)

Cross-Examination by Mr. Bangs.

I prepared City's Exhibit 95.